Forestry

AUG 21 1930

# VETERINARY MEDICINE

*September, 1930*

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No. 9
VOL. XXV

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Chicago, U. S. A.

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# Veterinary Medicine

VOL. XXV SEPTEMBER, 1930 No. 9

**Published Monthly by the Veterinary Magazine Corporation**
**75 East Wacker Drive, Chicago, Ill., U. S. A.**
**$4.00 a Year**

Entered as second-class matter Nov. 8, 1920, at the post office at Chicago, Ill., under the Act of Mar. 3, 1879.
Entered as second-class matter under the title of American Journal of Veterinary Medicine, July 19, 1910, at Chicago, Illinois, under Act of March 3, 1879.

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor

Nasal polypi and other defects of the nose and throat are frequently associated with asthma in the human and some cases have been relieved by correcting defects in the upper air passages. There is no apparent direct relation between nasal and throat disorders and asthma but there is certainly a reflex in some cases. Is it possible that some cases of emphysema (heaves) in horses may be due to reflexes induced by disorders of the upper air passages?

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The relative susceptibility of the skin and subcutaneous tissues to *B. anthracis* is of considerable interest and may be of importance in solving the problem of a permanent immunity. It has been shown that a fatal dose of *B. anthracis* in the skin of a rabbit can be tolerated subcutaneously. A subcutaneous inoculation of a non-lethal dose produces an immunity to both dermal and transcutaneous inoculation in some animals. —*Jour. A. M. A.*, 10/24/25.

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Rickets is a relatively common disease of children. Ninety per cent of a group of children in a New York asylum and approximately one-third of the children examined at New Haven, Connecticut, were affected with rickets in one form or another. According to investigators susceptibility to upper respiratory infections is increased by rickets in children. It would be interesting to know whether or not rachitic pigs, lambs and other animals are more subject to pulmonary infection.—Public Health (Mich.)

The cause of cancer is still unknown. It is known that a cancer is composed of rapidly growing and multiplying cells that are essentially embryonic in character. It has been demonstrated that tumors can be produced in chickens by the injection of filtered tumor juice and it has also been demonstrated that tumors can be produced in chickens by the injection of filtered juice of chick embryo and rat placenta. These facts are interesting and may be the forerunners of important discoveries.—*Science.*

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There is an apparent relationship of the sugar content of the blood and articular disorders due to infection in the human according to Pemberton. The sugar content of the blood is in direct ratio to assimilable sugar consumed and therefore those having a low tolerance for sugar are more prone to articular infections. Thus the provision of sugar in the diet by use of molasses and like products may be of value in reducing the incidence of polyarthritis in pigs.—*Science.*

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Of the 14 States in the South and one on the Pacific Coast quarantined in 1906 because of fever ticks, all but four have been freed of the parasite and of tick fever. With the completion of tick eradication in Mississippi only four states remain in the quarantined area—Florida, Texas, Arkansas, and Louisiana.

The "28-hour law" was designed primarily as a humane measure but which has increased returns to shippers because their animals reach market in better condition.

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There is a progressive anemia in cattle in certain sections of New Zealand that is thought to be due to an inability to assimilate iron. This condition occurs in cattle that are pastured on so-called pumice soil.—*Bio. Abst.*

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The history and development of the Brahman cattle in the United States, is given in detail in Farmers Bulletin No. 1361 of the U. S. Department of Agriculture. There are many interesting facts relative to the Brahman cattle in this bulletin that every veterinarian should know.

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According to Sweany a virus in tuberculosis lesions is capable of passing through the finest Berkefeld filters and of producing varying grades of disease in guinea pigs. In some instances emaciation and death results without lesions of tuberculosis and in others typical lesions of tuberculosis are produced. There is a possibility of an error in the filtration and the foregoing experiments should be duplicated before accepting apparent conclusions.—*Bio. Abst.*

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Pigs from sows that have ample exercise during the gestation period develop more rapidly than pigs from sows that have insufficient exercise. This is apparently in accord with the farmer's idea that mares that are given ordinary work will produce stronger and better developed foals than mares that are not worked.

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Although lime and sulphur dip when properly applied is effective in the treatment of psoroptic mange in sheep and goats, the calcium content of the dip in the form of calcium salts is difficult to remove from the wool or mohair. According to mill operators the calcium forms insoluble soaps and it is almost impossible to remove them by any known scouring process.—*Angora Journal.*

A small percentage of post vaccination trouble is known to follow the vaccination of man or animals against any disease.—E. A. Cahill.

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Cream may be stored at a zero temperature for a period of five or six months without injury to the cream as such, or for the making of butter provided the storage is in earthenware, porcelain or well tinned containers. Cream storage for only a short time in rusty containers or even in containers with slightly rusty seams, will have a metallic flavor.

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According to reports agalactia in sheep and goats may be successfully treated by the use of a 10% solution of sodium stovarsol administered subcutaneously in from 5cc to 10cc doses. In persistent cases, a series of three injections, 24 hours apart, has been used.—*Exp. Sta. Rec.*, Vol. 62.

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Although meat is one of the oldest of human foods, accurate and scientific knowledge of the factors influencing its quality and palatability has never been secured. Research in animal feeding has been conducted with the idea of increasing the efficiency with which animals make their gains, or of increasing or decreasing the proportion of fat obtained in preparation for market. A few exceptional feeders have made private observations of their own, and the general effect of a few feedstuffs (like fish meal for swine or sagebrush for sheep and goats) on the carcasses produced has been recognized by the slaughter. Practically nothing, however, has been done over the course of the long history of livestock production to determine the factors resulting in the delicacy of flavors, the tenderness of cuts, and the color of flesh that give the choicest parts of meat their final high value. Four years ago the U. S. Department of Agriculture in cooperation with 22 of the State agricultural experiment stations and the American Institute of Meat Packers undertook this study. It has proved a highly complicated and exceeding difficult problem but progress is being made.—*Armour's Bulletin.*

## DECLINE IN HOG TUBERCULOSIS IS SHOWN BY MEAT-INSPECTION RECORDS

In the past fiscal year the number of hog carcasses condemned as unsuitable for food because of tuberculosis was 9,170 less than in the previous year, and the number of parts of carcasses condemned for the same cause was 115,995 less. These figures represent declines of about 20 per cent. The eradication of tuberculosis among cattle on farms where the hogs are raised is the chief reason for the improved condition of the hogs, officials of the U. S. Department of Agricultural believe.

## AVOID LOSS FROM POISONOUS PLANTS

It is recommended that more attention be given to poisonous plants by stockmen and veterinarians in order that losses may be reduced. Three suggestions are offered for the reduction of plant poisoning:

1. Eradicate plants known to be poisonous.
2. Avoid areas containing poisonous plants at dangerous seasons.
3. Pasture with care, so that animals are not tempted to eat poisonous plants. —J. J. Pieper, University of Illinois, in Animal Pathology Exchange.

## HOW MANY CAN YOU ANSWER?

Although equine practice has decreased, there are some dealers that ask their veterinarian the following questions:

1. How break a horse or mule of halter pulling?
2. Is there an effective method of breaking a horse that kicks while hitched?
3. What is the cause and treatment of chest founder?
4. Is cross firing a serious defect?
5. How overcome a "lugger"?
6. What is the meaning of the statement "Smokes his pipe"?
7. Can "winging" be prevented by shoeing?
8. What is the cause and treatment of "tongue lolling"?

## CAUSES OF NON-BREEDING

Failure to breed in a cow is the result of absence of function or disturbed function of one or more of the reproductive organs of the cow, or of the bull. It is obvious, from the complexity of the problem, that in any specific case of sterility it may not be possible to determine what organ, or organs, is the cause of failure to reproduce. Or, if this can be determined, it may not be possible to determine the cause of the condition, or there may be no known method of correcting the trouble. To illustrate this last statement, it may be stated that sterility is occasionally due to failure of the ovary to develop the egg. The cause of this is unknown. Sterility is occasionally due to abscessation of one or both testicles of the bull.—E. T. Hallman in Animal Pathology Exchange.

## MILK-BORNE EPIDEMICS

Although the mortality from undulant fever is low, the morbidity is high, higher perhaps than many of us know. It manifests itself as a prolonged fever, sometimes recurrent, though not always, lasting anywhere from a few weeks to months. From the public health viewpoist undulant fever is probably as serious a problem as typhoid fever or scarlet fever. Bigelow and White of Massachusetts report more than 50 milk-borne epidemics that have been recorded involving some 30,000 cases of disease. From 1911 to 1928, inclusive, there have been in Massachusetts alone 1,468 cases of typhoid fever, 74 of diphtheria, 1,147 of scarlet fever, and 3,986 of septic sore throat attributed to milk as a carrier. Bad as undulant fever is, there are other milk-borne diseases many times worse. If the fear of undulant fever should be great enough to induce the consuming public to demand the pasteurization of all milk, then not only would undulant fever eliminate itself as a cause of disease in man, but a host of other milk-borne diseases many times worse than itself.—W. W. Lee, in Animal Pathology Exchange.

# Surgical Opportunities

By R. R. DYKSTRA, Manhattan, Kansas,
Division of Veterinary Medicine, Kansas State Agricultural College

THE time has definitely arrived in veterinary surgery that veterinarians must offer an unusual service if they expect to be patronized insofar as the more ordinary surgical operations are concerned. In years gone by, when there was a scarcity of graduate veterinarians and when the schools were trying to do the best that they could under the circumstances by supplying the veterinary service that was so badly needed, it was more essential to get the necessary operations performed than it was to look too closely to the method of their performance.

We hear complaints, quite frequently, that veterinary surgery no longer occupies the prominent part that it formerly did in the veterinarian's activities. We have often wondered whether there actually is a lack of surgical opportunities, or whether during the last few years the veterinarian has applied himself so diligently to the application of biological agents that he has been overlooking the surgical opportunities.

Inquiries received by the writer quite frequently indicate that there are still a large number of opportunities for the veterinary surgeon, provided he will conscientiously apply himself in a manner so as to deliver an unusual or highly professional service and in this way develop this important field of veterinary activities. The writer feels that there are many of these opportunities and is indicating below only a few, together with a more or less refined technique—refined at least when compared to methods of several years ago—which should have a strong appeal to the owner of valuable live stock and at the same time place within the veterinarian's grasp another source of revenue.

## Castration of Pigs

Undoubtedly a good deal of this surgical work is being done by the owner. At what cost, veterinarians alone know. Every year almost numberless hogs either die, develop scirrhous cords, or are so unthrifty following a crude operation that the economical value of the animal is largely impaired. If the veterinarian feels that the castration of pigs is an operation that will always remain in the hands of the layman owner, then he may at least ingratiate himself with that owner by demonstrating to him an improved technique.

The hog should of course be placed in dorsal recumbency and the operative area should be cleansed without making it "sloppy." The incision should be made about two inches long and in the groove formed by the medial surface of the hind limb and the animal's body. *In other words, the incision commences approximately at the inquinal opening and extends backward for a distance of two inches and in the groove mentioned above.* This incision is to be carried down to the vaginal tunics surrounding the cord of the testicle. The finger is then made to encircle the vaginal tunics with its enclosed testicular cord, and by traction on it the vaginal tunics with the contained cord and testicle are pulled forward out of the scrotum. With the emasculator the cord and its vaginal coverings is then severed at a distance of about an inch posterior to the point of exit from the inguinal canal. This operation then results not only in the complete removal of the testicle, but of its vaginal coverings as well, and not only does away with the danger of scirrhous cord development, but provides ample drainage in the right place for wound secretions, and if perchance during the operation it is detected that the animal is a cryptorchid or that it is affected with an inguinal hernia, these defects may be corrected through the same surgical wound. With minor exceptions, the technique as outlined above was to the writer's knowledge first developed in the Iowa State College.

### Spaying Heifers

The number of inquiries reaching me from various parts of the state of Kansas seem to indicate that more heifer spaying is being contemplated than for many years in the past.

One of the principal points in this operation is the satisfactory control of the patient. When Kansas cattle were purely range bred and therefore very wild, it was usually customary to restrain the animal by roping it and then stretching it out. Times and conditions have changed, however, so that the animals are more accustomed to being handled and therefore are more tractable. A satisfactory form of restraint must nevertheless be devised. If only a few animals are to be operated upon, each one may be handled individually by lashing it against a strong fence. If larger numbers are to be operated upon, it is very desirable to have a handling chute constructed which will facilitate the operation very much. *A refinement that has been introduced into the technique of this operation is the use of epidural anesthesia.* To the experienced anesthetist it is a trivial matter to inject from 20 to 30 cubic centimeters of a 1% solution of procain into either the first inter-coccygeal or sacro-coccygeal space and thus render the operative area—the fossa of the flank—and the genitals, insensitive. As progressive surgeons we owe this step to our patients and our clients. Otherwise there is but little difference in the surgical procedure as carried out in the standing position. Experience with a small number indicates that there is much less danger of surgical shock by resorting to anesthesia.

### Rumenotomy

Bloating of cattle is of rather frequent occurrence, this being due of course to the ever increasing consumption of such fermenting roughages as clover, alfalfa, and other legumes. They are especially likely to result in bloating, particularly in the spring when cattle are prone to overeat of these materials.

In the clinic of the Kansas State Agricultural College the operation has almost become a routine one. One of our clinicians—Frick—performed some fourteen of these operations in a single afternoon. In our work—and provided time permitted—we have resorted to both epidural anesthesia and local anesthesia over the line of incision in the fossa of the flank. This results in perfect anesthesia. An additional refinement consists in the use of the embroidery hoop and oiled cloth as recommended by Bardwell and Udall on page 302 of the July 1927 number of the *Cornell Veterinarian.* I can do no better than to quote their article:

"The opening in the skin is made about 6 inches long, and the muscles and peritoneum are cut to agree with the skin incision. A suture of heavy linen or umbilical tape is made through the wall of the rumen where it lies adjacent to the dorsal end of the incision in the abdominal wall. The ends are tied, and given to an assistant to hold. A similar suture is placed through the rumen, about 1.5 inches posterior to the first. Two more are then inserted at the ventral end of the incision. Two assistants, one on either side of the operator, now pull the rumen through the incision in the abdominal wall. The rumen is opened and held with the sutures so that the contents do not fall into the operative wound. A rubber sheet attached to a metal embroidery hoop is used to protect the edges of the wound from contamination while the contents of the rumen are being removed. The ring is turned in a vertical direction, and passed through the incision into the rumen, where it is adjusted in such a manner that the contents may be removed through the rubber sleeve. The compact material in the upper part of the rumen is removed. That in the lower part is semi-fluid, and is left, for it is thought to be of some value in maintaining the physiological contraction of the forestomachs. A search for the foreign body is then made. In a majority of cases the object which is causing the trouble is easily found. In a few cases it has been necessary to make a careful search of the pockets in the mucosa of the reticulum with the end of the finger. The thickening of the tissue around the foreign body will aid in locating

it. In removing the object, care should be taken not to tear down the adhesions. If they are broken down, it is porbable that they must form again to control the infection, and the area of local peritonitis is enlarged. The rubber sheet is now removed. The hands and arms are washed and disinfected. The edges of the incision in the rumen and abdominal wall are wiped with dry cotton. The incision in the rumen is closed with two rows of Lembert sutures, No. 4-6 catgut, or No. 12 silk being suitable. When catgut is used a double throw square knot is tied to prevent slipping. The top suture is left with long ends to be held by an assistant while the first row is inserted. The second row is made in like manner. The peritoneum and muscles are then sutured together with catgut. The peritoneum is not sutured separately. The skin is closed with mattress sutures of linen or silk. A piece of cloth is then tied around the cow in such a manner as to cover the incision; this will keep it clean and prevent contamination by flies. The stitches may be removed in ten days. If pus forms, a suture may be removed to permit disinfection and drainage of the affected area."

A large number of other operations could be described to indicate the refinements that have been introduced in recent years. In conclusion we wish to say again that the veterinarian owes it to his patient and to his client to perform the very best of high class professional service, and then it will be discovered that there are still many "surgical opportunities."

**Infected Penis in a Bull.**

## AN INTERESTING CASE OF ADENOSARCOMA IN A GILT

A carload, consisting of 160, eighty-pound shotes was purchased in Texas by a central Missouri farmer on Feb. 12th, 1930. These swine were delivered to the purchaser's farm and vaccinated by a veterinarian on Feb. 18th. A limited ration, consisting mostly of a thin slop, was given to these shotes from the time of arrival on the farm for a period of three weeks.

A few of these swine were noted to be unthrifty and were carefully inspected on March 15th, 1930. One gilt was quite thin and, according to the owner, had lost weight rapidly since vaccination, although the temperature was normal and the appetite was good. This gilt was destroyed for autopsy purposes and a careful post-mortem examination was made immediately.

Excepting for some small chronic pneumonic lesions and an ovoid tumorous mass about 7 by 10 inches, all organs were apparently normal. By carefully dissecting, the tumor was found to be definitely encapsulated and involved the left kidney, there being only a small portion of renal tissue that was recognizable. Although the tumor was definitely encapsulated it was distinctly lobulated. On sectioning, fibrous bands were found that extended in various directions, thus dividing the tumor into incomplete lobules of various size. The tumor tissue was grayish white in color and the neoplastic areas were interspersed with hemorrhagic areas, thus a cut section had an irregular mottled appearance. This tumor was an adenosarcoma. Although these tumors are occasionally found by meat inspectors, the finding of them clinically, we believe, is relatively rare.

The very interesting questions in this particular case are the size of the tumor and the age of the gilt. It is unusual that such tumors are found in hogs less than eight months of age and this particular gilt was less than six months of age and probably not more than four.

Kansas City, Mo. A. T. Kinsley.

# What Is Happening to Horse and Mule Use?

By WAYNE DINSMORE, Chicago, Illinois
Secretary, Horse Association of America

THE horse and mule situation should show steady improvement during the coming years. At least this is clearly indicated, because the shortage is now so marked that prices are beginning to advance—a fact which will react on breeders to the extent of inducing them to breed more horses and mules.

Breeding, furthermore, is increasing and will continue to increase in localities where good horses and mules are produced. Fewer of the trashy, inferior grades of animals are being produced, since the demand for them does not encourage their production. We confidently expect that three or four years from now, when colts now being foaled are ready to be put to work, they will command even higher prices than they are bringing today. By that time a lot of people who have been buying tractors for the last few years will have a severe headache over the bills they have had to pay and will be disposed to hustle out and find themselves some good horses.

We talked to a farmer down state in Illinois only a few weeks ago. "I am going to fit myself up an 8 and a 9-horse hitch," he said. "I have eight head of horses now and believe I can buy another good horse and full equipment for the hitch for $165; then that will be the end of it. I paid a bill last fall of $231 for gas and oil for my season's work and that set me thinking. I decided I could do it cheaper with horses."

We believe there are thousands of farmers who will come to the same conclusion, and all we are contending for is the use of horses and mules where they can save the user money; where they are cheaper, more efficient, more practical than other kinds of power. Preeminently, that is true on the farm.

During the past ten years there has been a reduction of 6,327,000 horses and of 110,000 mules on farms, making a total of 6,437,000 work animals. To maintain these animals would require the product of 16,092,500 acres, since horses and mules on farms consume per head annually the product of about 2½ acres of fertile corn belt land (or equivalent feed from lands of lesser productivity). It is known, of course, that growing colts and idle animals consume less than those at work, which makes the average of 2½ acres per head conservative for all animals on farms.

Horses and mules engaged in non-agricultural work consume the output from about four acres, and since there has been a decrease of 600,000 in numbers of horses and mules in cities during the past ten years, there is a further release of 2,400,000 acres of land which would have been required to maintain these animals.

This reduction in horses and mules, therefore, has diverted at least 18,000,000 acres of land from power purposes (rearing and maintaining work animals) to the production of surplus foodstuffs. Destroying the normal increase in horses through substitution by automobiles, trucks, and tractors has reduced the acreage needed for power production and maintenance from 107,162,500 to 52,905,000 acres—more than 50%.

This reduction has cost the farmer three markets: Namely, the normal increase in demand for hay; the normal increase in demand for grain; and the higher price he would otherwise be receiving for all other farm products.

Suppose that the same ratio of horses and mules to total population existed today as existed in 1900 when there was one horse or mule for each 3.08 persons. It would mean a total now of 38,965,000 draft horses and mules (basing the figures on the 1928 estimated total population of the United States—120,013,000). Of these horses and mules, some 6,500,000 would be engaged in non-agricultural work instead of the 1,500,000 now so engaged; about 5,000,000 would be used by farmers for driving; and some 18,000,000 would be employed at agricultural work, instead of the 16,000,000 now so employed. The remaining 9,465,000 would comprise young animals and breeding stock.

What would it mean to farmers to have this total of 38,965,000 horses and mules in existence?

It would mean ready sale at good prices for 650,000 horses and mules annually. This represents the number that would be absorbed each year by cities to replace losses (ten per cent) occurring among the 6,500,000 horses and mules that might be at work on streets.

It would mean ready sales and a steady market for 19,500,000 tons of hay and 1,218,750,000 bushels of oats, to feed horses and mules engaged in non-agricultural work—more than four times as much as is now being sold—since horses not on farms consume annually three tons of hay and an equal amount of oats or other grain, per head. In addition, of course, there would be pasture, hay, and grain for the projected 32,465,000 horses and mules on farms, instead of for the 18,762,000 at present in existence.

This would mean that pasture, hay, and grain would be needed for 13,703,000 additional farm animals. Allowing 2½ acres per animal (which is a fair allowance when idle animals and growing colts are considered) we should have an increase of 34,257,500 acres raising feed for such extra animals instead of raising grain and hay for dumping on the market.

Withdrawing this 34,257,500 acres from production of food for man and using it instead for production of power would ease the situation. And the use of 15,000,000 tons more hay and 937,500,000

**Eight-horse Team on 8-foot Tandem Disc on the Farm of Col. Geo. Seaman, Taylorville, Ill. The platform projects back far enough to prevent the driver falling in between the Discs. Col. Seaman has exhibited this team and hitch at several County Fairs and it will be seen at the State Fair at Springfield this Summer. This hitch is regularly used on Col. Seaman's farm.**

bushels more oats than we are now using, to feed horses and mules in non-agricultural work, besides helping the market for these commodities, would withdraw 20,000,000 acres more farm land from production of food for man. This is on the basis of three tons of hay and 62½ bushels of oats per acre—the product of four acres, in other words—to maintain a city work horse. Instead of having 18,492,500 acres more raising surplus food products, as we now have, we should have 54,257,500 acres more producing and maintaining animal power.

It is no wonder that from 1910 to 1929, the acreage of wheat harvested in the section comprising eastern Montana, Wyoming, Colorado, and New Mexico, and western North and South Dakotas, Nebraska, Kansas, Oklahoma, and Texas jumped from 22,211,000 acres to 40,953,000 acres; barley from 2,733,000 to 7,120,000 acres; rye from 170,319 to 1,679,000 acres; oats from 8,821,000 to 11,298,000 acres; and corn from 29,073,000 to 30,816,000 acres.

And certainly it is no wonder there are grain surpluses and that farmers complain of no markets and of low prices.

In remedying the situation through use of horses and mules, two things are essential. One is that the horses and mules be used in the largest units consistent with size of the farm; the other is that the user know and practice modern methods of keeping teams at low cost.

If a man has 200 acres, one-fourth of which are in pasture and lots, he has need for six horses or mules and should use all in a 6-horse hitch (3 and 3) in plowing, discing, harrowing, and drilling; and he should use four in cultivating, with four or five on the binder in harvest. If he has 240 acres, 40 of which are in pasture, he needs eight horses and mules and should use 8-horse hitches in all operations where it is feasible to do so.

Every veterinarian should have our booklets dealing with these subjects. (The multiple hitches and keeping work animals at low cost). Both will be sent for ten cents and a request on your business letterhead. Extra copies for distribution to your clients will be furnished free if you will help us to arrange for a hitch demonstration in your community.

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## THE FARMER'S HORSE POWER

American agriculture is our most highly powered industry except the railroads. Its aggregate capacity is about 50,000,000 horsepower—greater than the capacity of all the prime movers in factories and electric generating stations combined.

But the farmer's great array of power, is wasteful of money, materials, time and attention. Except his electric motors and windmills, the farmer's power machines demand almost constant attention, and require time and labor to put them into action. They consist of more than 24,000,000 small units. Of these, 18,750,000 are animals with 35% of the total power capacity.

From all his power the farmer in any year gets only about 4% of the capacity if it were working and earning its keep all the time. The manufacturer gets at least 13% of the entire working capacity of his engines, and electric generating stations deliver better than 30% of their possible yearly output of power.

For power the farmer pays at least 25% of his gross income, while the cost of fuel and power in manufacturing is only 3% of the value of the output.

# The Cost of Running a Car

By E. T. BAKER, Moscow, Idaho

HOW many veterinarians know just how much it costs them to flit around over the country in a car? Having been asked this question so often, we decided to keep an accurate account of all our car expenses.

Two years ago, June 1, 1928, we took possession of our fifth Buick—a coupe. We might say in passing, that in fifteen years we have paid $7,100 for the five cars, and received $3,450 trade-in, which makes the total cash expenditure $3,650, or about $20 per month to own a car.

We drive a car around 6,000 miles per year. We take many of our longest trips to sheep camps by railroad and thence by the camp tender's "galloping goose," which is usually one of Henry Ford's earlier efforts. A sheep man will drive a light truck over any kind of a trail as long as he can hop the rocks or stumps. We have learned to leave our car at home, and not long ago we made a trip in a variety of vehicles. We travelled fifty miles by train, sixty on a small boat, and the remainder, about eighteen miles, on the hurricane deck of a small, wiry cayuse to a deep canyon in the Snake river region. As our family have been all over the Northwest, and scenery is an old story to us, we use our car for nothing but rural practice.

Not more than a dozen years ago, highways were few and far between, and even today, most of our work is over dirt roads. We have to use chains about five months in the year, because we always receive a call in rainy or snowy weather out on the worst clay roads in the country. Our territory is very hilly or "rolling," as a polite real estate agent would term it.

We have a chart hanging up in our garage, and whenever we do anything to the car, outside of driving it, we make a note of it. We can refer to this chart, and tell just how many miles we traveled each month; amount of gas and cost; date of oil and grease change; when battery was last tested; tire punctures and which one; when chains are put on or taken off; mechanical work done; accessories purchased, and any other expense. It only takes a few minutes each month to keep up this chart, but it is interesting to "count up the cost" at the end of the year.

In 1928 and 1929 our license cost $24, but in 1930, on account of the politicians needing a little more money, it advanced to $25. Our car came equipped with four-ply Goodrich Silvertowns, but these played out at 5,500 miles and we replaced them with six-ply, heavy duty Firestones. In the two years we had eight flat tires, but no blow-outs.

In winter we use C. P. glycerin in the radiator, costing around four dollars a gallon. There is no odor, and very little evaporation, and the same glycerin can be used for several seasons.

We use ethyl gas, costing from 27 to 30 cents per gallon, and average 14 miles to the gallon. Oil is 35c per quart, and we use six quarts every thousand miles. We inflate our tires every week, and have the battery looked after twice a month.

The first year we traveled 5,289 miles; used 413 gallons gas, or 13 miles to the gallon. Had three flat tires, and purchased one new tire and tube and one set heavy chains. One heavy set of chains were worn out, as we had the hardest winter in years. Our total expense, including license, fire, theft and liability insurance, seat covers, mechanical adjustments, etc., was $184.55, or 3½c per mile.

The second year we traveled 5,413 miles; used 391 gallons gas; purchased four new tires and tubes; new purolator;

new spark plugs, chains, etc., and our expense was $216.75 or 4c per mile. We had five flat tires.

Total mileage for the two years was 10,702; gasoline consumption 804 gallons; operating cost was $401.30, or not quite four cents per mile.

Adding $600 depreciation (20% per year) the total cost over all was $1,001.30, or nine and one-third cents per mile.

We figure that in a series of years, every time the speedometer clicks off one mile, a thin dime has dropped out of our strongbox. This is something to consider in making charges. One might well think of it also when making autopsies. No doubt it is advisable to make an autopsy without charge on occasion; but we should face the fact that it cost money as well as time to do so. Mileage alone costs us two simoleons on an autopsy 10 miles from the office.

Of course, we hear many tales of how cheap cars are run; "twenty miles to the gallon," and no mechanical expenses whatever, and so on, but our chart does not kid itself or anyone else; its figures speak louder than words, and give all the intimate details of an auto's private life.

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## INTESTINAL PARASITISM COMPLICATED WITH CEREBRAL HEMORRHAGIC SEPTICEMIA

A herd of 40 two-year-old steers, on full feed, of a good quality corn and alfalfa hay, was about ready for market when sickness occurred. All of the steers excepting one had been doing exceptionally well until Feb. 28th, when a steer was noted to be off feed.

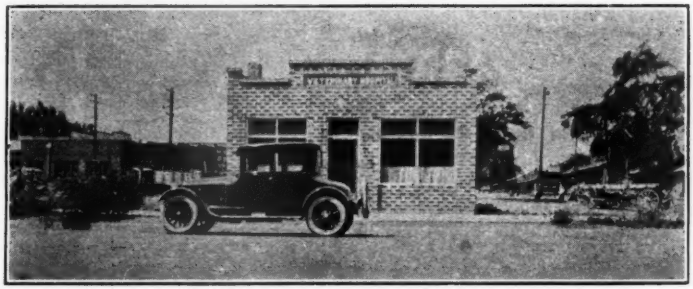
This steer was carefully examined on March 3rd, and the following symptoms noted: inappetence, gauntness, nervousness, apparent blindness, stiff, uncertain gait, nose held high, temperature 102° F. and a marked diarrhea; the discharge being thin and very dark in color. On March 4th, another steer was sick, showing the same symptoms, except for the stiffness of gait. On March 5th, the steer that had not made a good gain was noted to hold his head high and showed stiffness of gait. On March 6th, all three of the affected steers were down, had heads thrown back, and were extremely nervous. Two of them died during the night of March 6th.

Lesions found consisted of some pulmonary congestion and numerous small nodules in the mucosa of the intestine. There were also several small hemorrhagic areas in the intestinal mucosa.

Laboratory tests revealed the presence of numerous parasites, eggs and microorganisms that were identical to the *B. bipolaris*.

This herd was given the following treatment. Copper sulphate, one dram, and iron sulphate, three drams, per thousand-pound animal, once daily for ten days. There was no further loss or disease developed in these cattle.

Coin, Ia. W. H. Buchleiter.



**This is the Hospital of Dr. Peter McIntosh at Yakima, Washington, and indicates the success that has attended the practice of many veterinarians in the Great Northwest.**

# Diatetic Diseases in Feed Lot Lambs

By I. E. NEWSOM, Fort Collins, Colorado,
Laboratory of Veterinary Pathology, Colorado Agricultural Experiment Station

THERE is an unfortunate tendency among veterinarians to look for evidences of infection in outbreaks of disease among feed lot lambs, and to lose sight of grave dietetic errors. This is not surprising since infectious diseases are so much stressed in our school curricula, and since biological preparations are largely made for the control of bacterial diseases. It is true that infectious maladies are common in feed lot lambs, but it is also true that nutritional disturbances are frequently overlooked. The owner of the lambs often feels that no disease is present when the cause has been given as dietary. He is therefore apt to be more duly impressed if the causative factor is an infection.

Feed lot lambs coming from western ranges are usually driven to the nearest shipping point, there separated from their mothers and held for a 12 to 24-hour shrink before being weighed. They are then put on cars and shipped considerable distances, oftentimes going without food for as much as thirty-six hours additional. When feed is given it is of a variety to which the lambs are not accustomed, and as a consequence by the time the lambs arrive in the feed lots, due to hunger and change of forage, the digestive system may be much upset. It is not surprising then that symptoms of dietetic disturbances, which are indicated by scouring and loss of appetite, are often apparent from the very beginning. It is true also that these conditions outlined pave the way for invasion of microorganisms, but for the purpose of this paper we prefer to leave them out of consideration. With these facts in mind it is important that the veterinarian shall recognize the symptoms of dietetic error as well as those due to bacteria.

Special care should be given to the lambs during the first two weeks, and ordinarily no grain should be given during this time. The lambs should be given the best quality of hay that the owner can furnish, the poorer stacks being left for use after the lambs become accustomed to feed. Where lambs are fed on farms it is also well to allow them to run widely over the fields where the crops have been harvested, in order to pick up weeds, waste grasses, and other crop remnants. During this early period a diarrhea may be shown by a fair percentage of the lambs. After eliminating the infectious causes of this trouble the non-infectious variety can be best handled by moving the sick animals to a special pen. A good quality hay, a little bran, some oats, or a sprinkling of linseed meal may be found advantageous, but these should be given *sparingly*. Individual treatment is often advisable. It should be started by the administration of a laxative,—mineral oil in one to two-ounce doses, or epsom salts, one ounce. This can be followed by daily doses of intestinal astringents such as bismuth, tannic acid, naphthalin, etc. A convenient way of administering these agents is to mix them with mineral oil in such amounts that they can be given with a syringe. Drenching sheep, by the inexperienced, is fraught with danger. I have known of a number of instances where owners have killed as many as fifteen to twenty-five lambs in succession by unskillful drenching. The head should not be held higher than a horizontal position, and the material should be allowed to pass into the mouth slowly. The dose syringe is much to be preferred where the quantity will allow. The capsule method can be used but it has little advantage over the syringe. As fast as the lambs become normal they can be returned to the main flock and the sick can be removed daily to the hospital pen. I am of the opinion that daily treatment of lambs showing early scouring will be profitable.

When the lambs are learning to eat grain there comes another critical period, as some take to it more readily than others and may

get too much, even though the total amount fed is comparatively small. Ordinarily grain is placed in the troughs, mixed with a little salt and in extremely small amounts. This is gradually increased until the lambs are on full feed at about six weeks after being placed in the pens. Here again symptoms of dietetic disease are manifested by scouring, loss of appetite, vomiting, and in the more acute cases by cerebral disturbances. Any symptoms of this kind are sufficient to cause the total amount of grain to be reduced, and the sick animals to be removed to the hospital pen for treatment. Great care is essential at this stage.

After the lambs are on full feed, then very serious losses may develop which apparently are associated with too much concentrated feed. This condition has been variously designated as apoplexy, gastro-enteritis, encephalitis, indigestion, and finally, by us, as over-eating. It is to be seen in certain flocks on full grain feed, regardless of the kind of grain fed. It affects, however, only the strongest, fattest, most vigorous lambs in the flock, which makes it easy to differentiate from infectious maladies. These latter usually come within the first two weeks and before the lambs are on a full grain ration. They also most commonly affect the weaker lambs. The symptoms of over-eating consist of throwing the head upward and backward, or sometimes pushing against a fence, or walking in a circle, indicating cerebral congestion. Occasionally a strong vigorous lamb will return from the grain pen in apparently perfect health, suddenly jump into the air, fall over, go into spasms and die in convulsions, all within a few minutes. At other times the symptoms will last longer and will consist of scouring and loss of appetite. In many cases the animals recover.

In some of these instances no lesions whatever can be found on portmortem examination. At other times a severe gastritis or enteritis is evident. Frequently large hemorrhages are seen in the diaphragm, abdominal muscles and under the peritoneum, over the fourth stomach and intestines. These large blotchy hemorrhages are fairly typical of this malady, although they are frequently absent. The pericardium usually contains a straw-colored coagulum.

Microscopic examination of the cerebral meninges will reveal a round cell infiltration in possibly 10% of the cases showing cerebral symptoms. Repeated inoculation of cerebral substance into the brain of rabbits has failed to show the presence of any virus that could be transmitted to these animals. In the acute cases sugar is always present in the urine, but after an animal has been down for two or three days without eating, the sugar test may be negative. The specific gravity is usually high.

This malady must be differentiated from hemorrhagic septicemia, which seems now to be quite easy. We have never seen the latter disease in strong, vigorous lambs on full grain feed. Bacteriological examination, especially rabbit inoculation, will be negative in these cases of over-eating, whereas in hemorrhagic septicemia the bipolar organism should be isolated in a large percentage of cases. We pay little attention to the smear method for determining bipolar organisms, preferring to show that they have virulence for rabbits, and can be obtained in culture.

The control of this condition due to overfeeding is not easy, but consists in cutting down on the grain ration until the losses stop. Except for diagnostic purposes it is not necessary to eliminate the grain ration entirely, and in feeding lambs it is not desirable. Cutting off the grain sets the lambs back resulting in a considerable economic loss. Simply cutting down is often sufficient. When this disease develops it often happens that a fair percentage of the lambs is ready for market, and in that case such lambs should be sorted out and shipped, being careful to cut down the amount of feed given to the remainder. Special attention should be given to see that the trough space is such that no lamb can get more than his share. We usually allow one foot of linear trough per lamb. If several lambs are seen to be off feed the grain must be cut down on the balance proportionally. Even though the grain is mixed with the hay and ground together, the disease still develops when there is an excessive amount of grain

fed. This trouble makes it almost impossible to lamb down corn in the field, or to let lambs harvest peas. If grain crops could be harvested by turning the lambs onto them it would create a considerable economic saving, but experience shows that in the long run the death loss is too great. Individual treatment of lambs in this condition is usually of very little value. Flock treatment by means of controlled rations is the only effective method. The greater the variety of food the less likely is the disease to develop. Radical changes however are to be avoided always.

# Veterinary Problems in the Southeast

By M. R. BLACKSTOCK, Spartanburg, South Carolina

IN ATTEMPTING to depict the veterinary problems for the practitioner in the southeast, will say that they are real problems at this time and no doubt other sections of the country have similar problems to solve.

We are located in what is known as the Piedmont section of South Carolina or at the foothills of the Blue Ridge Mountains. This part of state is much different from the southern part or "low country" as it is commonly termed.

Agriculturally we are in the cotton belt, which has always meant a one-crop district; where feeds and food products are imported from the north and west and cotton and its products are exported. To those not familiar with the cotton market or the cost of production, will say that for last year's crop we received from 15 to 18 cents per pound for the staple and it might have been less had not the United States Government aided in setting the price. This is little more than the cost of production which signifies that the small farmer has scarcely made his rations, and that the land owner on the whole has not made enough to pay his taxes. The veterinarian who has worked for these people is still waiting for his money.

We are also in the heart of the cotton mill industry, but with low price of cloth and poor demand many mills have worked but part time and at such low wages that employes have had a struggle to live the last few years. Many of these people keep cows and are inclined to call a veterinarian when needed but of course cannot afford to, under present conditions.

We are in reality a rural section, but from ten to twenty hours travel from all the eastern cities which means we have an unlimited market. We have a wonderful climate and a soil that will grow any grains, fruits or vegetables that this latitude can produce. Diversification is the great need here and many are heeding the call. In the last few years many truck farms have been started as well as fruit and pecan orchards and it will be only a few years until these will be large industries. Cattle and hogs as well as poultry are being increased in numbers and this will mean much to the practitioner. It will also mean that the farmer must work 365 days in the year instead of the 60 to 90 days required for a cotton crop. I might add that about half of our rural population is colored which accounts for the slow progress in changing from a one crop method.

I began practice in this section more than seventeen years ago and at that time it was divided by mules, horses, cows and hogs. Today it is mostly mules and cows. Dog practice has rapidly increased and some poultry practice has come into being of late. I believe veterinarians all over the country have experienced this change.

We have seen the peak of real estate prices and now the slump, but all in all we have a bright future to look forward to in this section.

# The Practitioner and Disease Control

By H. A. WILSON, Jefferson City, Missouri.

NUMEROUS plans for the control of livestock diseases are in operation, while many, many more have been proposed. Most of the plans now in operation, and administered by the federal government or by the different state governments, are apparently giving satisfaction, or, doubtless, a change of policy would be immediately instituted.

A state live stock sanitary officer, holding an executive position, if not careful, will find himself confronted with a natural tendency to overlook the importance of the veterinary practitioner as a factor in locating and stamping out contagious or infectious diseases. Too much stress is often placed upon the activities, as well as the abilities, of field men. Notwithstanding that it is the policy of most state live stock sanitary officials, as well as the federal officials, to handpick field men and select only those who are well qualified for the class of work expected of them, and without political affiliation, I make the statement, without fear of contradiction, that one good, wide awake, qualified practitioner can locate more contagious and infectious diseases within a week of routine practice than an outside field man, who is a stranger in the community, however hard he may work, can locate in a month. I say this without the slightest intention of casting aspersions upon the field man, for indeed the field man is a necessity. The state may ask things of him it could not well ask of a resident practitioner, simply because if the resident practitioner were compelled to enforce drastic measures, which are often necessary to the eradication of a livestock pestilence, it might result in permanently putting the resident practitioner out of business in that particular community. Therefore, the assistance from outside forces, whether it be federal or state, is often most desirable to the local practitioner as well as to the state cooperating with the federal department.

The executive should ever keep in mind that practitioners are better acquainted with local conditions than anybody else. It is in most instances the practitioner who will be called upon first to treat an animal, be it suffering from colic, mastitis, anthrax, or foot and mouth disease. To him comes first knowledge of the presence not only of the routine disabilities of practice but also the outbreaks of serious epizootics of which the live stock sanitary authorities both state and federal, have to be notified.

If the attitude of the state department toward the practitioner is one of indifference, the practitioner will not be so nearly apt to report a suspicious looking case to the state office, because he feels that he will get no credit for so doing and may be criticized if the case turns out to be innocuous; whereas, if the practitioners are fully recognized, and their importance to a sanitary system realized, then, with few exceptions, the practitioner will feel that he is a component part of the state sanitary system, and even of that higher order—the federal sanitary system, and consequently will be ever eager to cooperate with both departments and report to them anything that he may encounter in his daily routine practice that even bears the least resemblance to a serious animal pestilence which might be fanned into the flame of a widespread outbreak.

Speaking in military parlance, I like to think of the practitioners in the terms of infantry and scout companies. Let the government and state boom away with all of the heavy artillery at their disposal; it may bring in its tank corps, its air corps; figuratively speaking, it may have machine gun battalions, cavalry and gas units galore, but, without the great army of practitioners, who are constantly serving in the capacity of the intelligence division, and pushing ahead in their daily routine, as do the dough boys in the case of an attack, advancement,

so far as disease detection and even disease control would be an uphill business.

I have often been criticized, sometimes severely, because of my generous attitude toward the appointment of deputies. I am perfectly frank to confess that I have made some serious mistakes in appointing certain men to the deputy force, men who later I have been compelled to divorce from the state service. Nevertheless, I consider that a cold blooded limitation of a state deputy force is a more serious blunder than is the general policy of making a commissioned deputy out of every graduate veterinary practitioner, with the possible exception of small animal practitioners in large cities, who in most cases do not want deputyships and whom I think in a majority of cases would be unwise to accept them, simply because many owners of pet animals seem to have an ungrounded and unfounded fear of having them quarantined.

It is an easy matter to divorce any man from the deputy force, providing, of course, such divorcement is rendered in justice to the state department. It is an easier matter with the policy of limitation to overlook an outstanding practitioner, a man who would be a real asset to any state department and by all means should be upon the deputy roster. It is a very simple matter to keep in close contact with the deputy force. We receive daily in this office reports, health certificates, and test charts from at least a dozen of them. It is lamentably true that some of our deputies never communicate with the office—they seldom report anything. Getting information out of one of them is just as easy as eating soup with a red-hot knitting needle; but after all such deputies are few.

The question might arise in the mind of the reader why should such a man be retained on the list. The answer is that often times that fellow is too busy to report every thing that occurs in his community, but in the case of a real emergency might be the most dependable man in the entire county. Nevertheless, a deputy owes the state department the courtesy of establishing a reasonable line of communication with the state department.

In conclusion, I care not what system or plan might be formulated for disease detection and control; and, regardless of the qualifications and ability of the state or federal specialist employed for field work, we must not underestimate nor overlook the vital importance of having the good will of the practicing veterinarians, and likewise placing them in a position legally and otherwise to not only be obliged but to be eager as well to report to the state and federal offices any appearance of any suspicious looking cases as well as infractions of state and federal regulations. To do otherwise is like attempting to win a war without an intelligence branch, combined with other well coordinated units which now go to make up a properly balanced and constructed military machine.

Someone has said, "The practitioner is the backbone of the veterinary profession." My personal opinion is that he is not only the backbone but he is the head and feet as well —for without him we mahogany desk veterinarians would be just like a paralyzed creature—able to think but unable to move. So why not enlarge the anatomical make-up of the practitioner and attach to him other organs just as important as playing the role of backbone?

**Cow affected with mammitis, exhibiting all the symptoms of the advanced stages of toxemia. Photo by S. L. Stewart.**

## ABERRATION OF THE APETITE IN CALVES

During the last winter I have had twelve calves that got the best of me. They were spring and early summer calves, and after being stabled were fed all the second crop clover they could eat from a rack, and plenty of ground oats, corn and bran. They would lick the pine boards of the pen until you could hear them any place in the barn (80x110 ft.) In some places, they cut through white pine boards an inch thick, and would cut it away from the knots until they would stand out a half inch.

Plenty of lime was used on the ground where the clover hay was cut and it is of good quality.

These calves have the best of running water, and salt at all times. I tried feeding air slacked lime and hickory and rock oak ashes in the chop, and several other changes and it didn't make a bit of difference. I have had this happen several times under the same conditions. I would certainly like to know the cause, and remedy. The calves grew fine all winter and have shed out and look in the pink of condition.—C. A. M., Md.

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**Reply:** I am inclined to diagnose the affection of your calves as licking disease, sometimes known as pica.

According to Hutyra and Marek, pica is manifested in a morbid tendency to lick, gnaw, and devour various objects. It appears to be the result of a disturbance in metabolism, which carries in its train chronic digestive, nutritive, and nervous disturbances. These authorities state that it occurs only in certain regions and affects largely, if not exclusively, cattle, more particularly cows and weaned calves or heifers. In certain sections the disease appears to be stationary on a certain farm, but occurs enzootically. It usually becomes manifest in winter, and its intensity is higher the longer the winter has lasted. Pica, however, has been observed in animals running on pasture.

It appears that relatively little is known definitely regarding the exact etiology of the licking disease. Consequently treatment is largely empirical. However, good results have been reported from the administration of ordinary cattle salt in cases where animals have been deprived of salt. For a more extended description of the treatment and prevention of the affection, you are referred to the above authors' "Pathology and Therapeutics of the Diseases of Domestic Animals."

In view of the fact that these calves grew fine all winter, shed out well in the spring, and now appear to be in the pink of condition, little concern need be felt regarding their health, it seems to me.—F. B. H.

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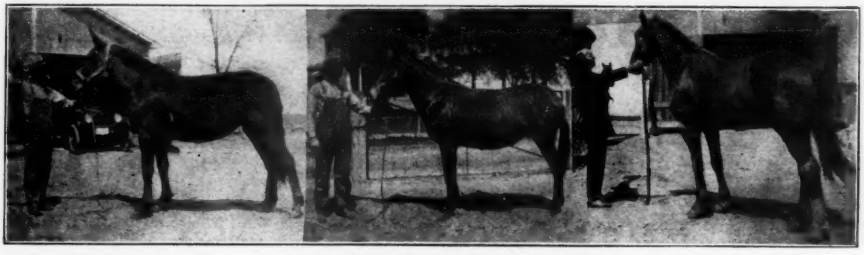
**Reply:** The condition you describe is not at all unusual in certain localities. We have had several such experiences here where we think our pasture lands and grasses are of the best.

It is my judgment that your trouble is



**Military Animals**

**Left to right: Wheel Mule, height 16-2; weight 1200 lbs.; Pack Mule, height 14-2, weight 900 lbs.; Light Artillery Horse, height 16-1, weight 1500 lbs.**

plainly nutritional and should be corrected by proper balance of minerals and vitamins. Ground bone and ground lime stone will not correct it; vitamins too are necessary. These vitamins your calves will obtain when on grass, but during the feeding season in certain localities, they must be supplied along with the minerals. I have found yeast powder the most satisfactory form in which to include the necessary vitamins.

Horses need more vitamins than cattle and dogs still more than horses. In treating nutritional diseases, one must never overlook the fact that vitamins are necessary to the assilimation of minerals.—J. F. D.

## ATYPICAL INFLUENZA IN A HORSE

I have a patient, a grade mare, 5-gaited saddle, 1,000 pounds, eight years old. She was in fine shape until three weeks ago. She started with slight cold, then developed what I diagnosed pharyngitis, wheezing like something was in the nasal passage far back, but nothing is there to obstruct. She did not eat for ten days, but could drink some. Temperature 103 deg. to 104.5 deg. F.

After two weeks, the right hock and left knee swelled some and down to the fetlock. It was not sore to the touch. Became stiff from standing—did not lie down for two weeks. Respirations long and slow, but made a noise that could be heard 125 feet.

No cough, except when I washed out the nose and pharynx with ephedrin in oil, with atomizer or with mercurochrome 2 per cent. Gave acenite, belladonna, bryonia and spirits nitre with equine cough syrup. The temperature went down; the wheezing stopped for three days; the stiffness left to great extent and she ate hay and grain and drank well. Then the same thing returned, except the temperature did not rise again more than to 101 deg. F.

When wheezing badly there was a little clear mucus discharge from the nostril, and some saliva comes from the mouth at times. No odor at any time. Now she lies down and rests well.

When at her worst, I had her steamed four times a day with tincture benzoin compound and turpentine in hot water. No swelling on the outside except very slight filling under the pharynx, which has disappeared. At no time has there been any laryngeal trouble. This condition has subsided and returned four times since first two weeks.

Can you give me any light on the case?—H. S. R., Pennsylvania.

**Reply:** We have a number of these cases every year. The common name in this region is "mountain fever." Our diagnosis is an obscure type of influenza.

Our best line of treatment has been: Potassium dichromate, two drams, soluble saccharine, one-half dram, fluid extract aromatic cascara, one ounce, and water q. s. one pint. Give tablespoonful on feed morning and night.

We usually administer either influenza bacterin or the hem. sept. bacterin, for three doses, about five days apart. Later on, if the animal does not seem normal, we give potassium iodid. It takes from six months to several years for a complete recovery to take place, when the patient does nicely. It seems to be a systemic infection, and we like to use iodex or a similar ointment over the throat as an inunction. Ammonium chlorid is very useful in the first stages. —E. T. B.

## RABIES IN MICHIGAN

For several weeks past rabies has been on the increase in Michigan and quarantines are now in force on nine counties located in the southern half of the southern peninsula and one in the western end of the northern peninsula. The elimination of the stray and homeless dog and proper and regular anti-rabic vaccination of all others would go a long way towards eliminating the disease.—State Veterinarian Clark.

# Examination of Feces for Parasite Eggs

THE day has long since passed if it ever existed when it sufficed to poke about with a stick in the feces of an animal, or just look at the animal and guess that it did or did not have worms. Great progress has been made in the science of parasitology, and more refined, more exact and far more productive methods of examination for the detection of parasite infestation must be employed by any veterinarian who makes even a pretense of keeping up to date in his profession and rendering his clientele a scientific, worth while service.

An examination of feces for the detection of the eggs of intestinal parasites is so important and so frequently called for that it must be regarded as a routine measure in small animal practice; like recording the name and address of the owner or tagging the leash and collar. In other practice, the need for it is only a little less universal.

A microscope of course, is essential for such an examination. If there is any veterinarian who still thinks that he can render a good enough service in his practice without the microscopic examination of feces, it may be mentioned that this instrument is equally essential or nearly so in the diagnosis of skin diseases, and for other purposes, and furthermore, that the price of a microscope is not to be considered an expense, but an investment that will yield as great a return in additional fees as any investment for his practice that a veterinarian can make, to say nothing of the satisfaction it brings.

While on the subject of the microscope, it should be said that a laboratory instrument is the one to procure. While low-power magnification may suffice for the examination of feces and skin scrapings, the cheap instruments, because of limited field, inconvenience of handling, inadequate stage, difficulty of adjustment, poor definition of objects as small as parasite eggs (distinguishing characteristics cannot be seen), etc., are but makeshifts in the hands of the inexperienced; and are generally unsatisfactory. For the busy practitioner they are but interesting scientific toys and not likely to be used much longer than the average toy.

There are two general methods of examining feces to determine the presence or absence of parasite eggs, and if eggs are present, the identification of the parasites with which the animal is infested. They are known as the smear method and the gravity method. The latter is often termed the "sugar method," although various solutions of high specific gravity, other than sugar solutions may be used.

Both methods have their champions who stoutly maintain the superiority of the method of their choice. There are certain advantages and disadvantages of each, however, that are not subject to question. The smear method requires the lesser equipment and the gravity method is the more exact. As to which is the quicker, there is not an unanimity of opinion.

### Smear Method

In addition to a microscope, which is required in both methods, the smear method requires only a glass slide in the way of equipment. A thin smear of feces is made over the center of the slide and to this is added a drop or two of water or an equal amount of a 10% solution of caustic soda or caustic potash.

The smear is then examined under the low-power (10X ocular and 16mm or 2/3 objective). No cover glass is required.

Advantages claimed for the method are that little equipment is required. The examination can be made quickly and that if the animal is parasitized to a harmful extent, the eggs will be numerous enough in the feces to reveal them even in this very small portion of the total amount of feces. If eggs are not detected in the first smear, usually two

or three or even a half dozen smears are made before making a negative diagnosis.

**Gravity Method**

This method was originated by Dr. A. Leslie Sheather of the Royal Veterinary College. He is known to American veterinarians as one of the translators of Hutyra and Marek.

Considerable equipment is required, but other than the microscope, the cost of it is very little. Benbrook[1] lists the equipment required as follows:

Microscope of the usual medical type giving low power and high power magnification of approximately 100 and 400 diameters.

Centrifuge: Hand, water, steam or electric types may be used, the latter being preferable.

Microscope slides 1 x 3 inches.

Micro cover-slips, ¾ inch squares.

Several stout-wall test tubes size 4 x ½ inch, or centrifuge tubes of 15cc capacity.

Several breakers of 100cc capacity; or, ordinary drinking glasses.

Wire gauze tea strainer of approximately 30 mesh per inch.

Several 6-inch lengths of 5mm glass rod.

Wooden tongue blades.

Fine pointed forceps, 5-inch.

Granulated sugar.

The same author gives the following directions for the preparation of the sugar solution, and for making the fecal examination:

Sugar solution should be made as follows:

Granulated sugar, 1 pound.

Water, 12 ounces.

Dissolve the sugar in the water, by immersing the bottle in hot water.

Add 1% phenol as a preservative.

To make a "headed" glass rod heat one end of a six inch length of 5mm glass rod until it is soft enough to be "headed" against a cold metal object. The head portion should be just slightly less in diameter than the inside of the tubes used. A heavy glass rod, slightly smaller than the inside of the tube may be used in place of the headed rod.

1. Pick up at least 1gm. of feces using tongue blade and place it in sufficient water to liquify it. Do not use too much water.

2. Thoroughly mix the feces with the water.

3. Coarse particles may be removed if necessary by straining.

4. Fill a test tube or centrifuge tube nearly half full of the fecal mixture.

5. Add to the above an equal quantity of sugar solution.

6. Mix by slowly inverting the tube several times.

7. Centrifuge the tube containing the mixture for about three minutes at moderate speed, 1,500 to 2,000 r.p.m. Centrifuging may be omitted if the tube is allowed to stand 12 to 24 hours.

8. Remove the tube from the centrifuge to a test tube holder without shaking.

9. Lift off the surface layer of fluid (which now contains the eggs) from the tube by means of the prepared glass rod. The rod should be slowly lowered into the tube and the instant full contact is made with the liquid withdraw the rod quickly bringing with it a large drop.

10. Transfer the drop from the rod to a microscope slide by gently rotating the rod in the center of the slide. A second or third drop may be added to the first in order to obtain sufficient material to fill in under a micro cover-slip.

11. Carefully lower a micro cover-slip on the drop without pressure.

12. Examine the slide under the low power of the microscope. For best results, bright illumination should be obtained by adjusting the mirrow and condenser and then modified by closing the diaphragm opening. The specimen should be searched in a systematic manner in order to see all parts of the drop

[1] Benbrook, E. A.; Fecal Examination for Evidence of Parasitism in Domestic Animals; Division of Veterinary Medicine, Iowa State College, Veterinary Practitioners' Bulletin, Vol. IX, No. 1, April, 1929.

and yet not go over the same part more than once.

13. When parasite eggs are seen, the high dry power should be used for identification in comparison with the photomicrographs.

It would be well to mention that the fecal examination method described may not be absolutely perfect in its results for various reasons:

1. No eggs may be found because the parasites present are not mature enough to produce eggs.

2. Animals having diarrhea may pass parasite eggs so diluted by liquid feces as to make detection difficult.

3. Tapeworm eggs may be passed within the segments of the worm. Thus examination for tapeworms may be negative, or unnecessary when segments are observed in the feces.

4. Oily substances such as castor oil in the feces may interfere with the findings of eggs, by floating on the top of the tube contents. Various methods have been attempted in order to remove such oil from feces but so far without success.

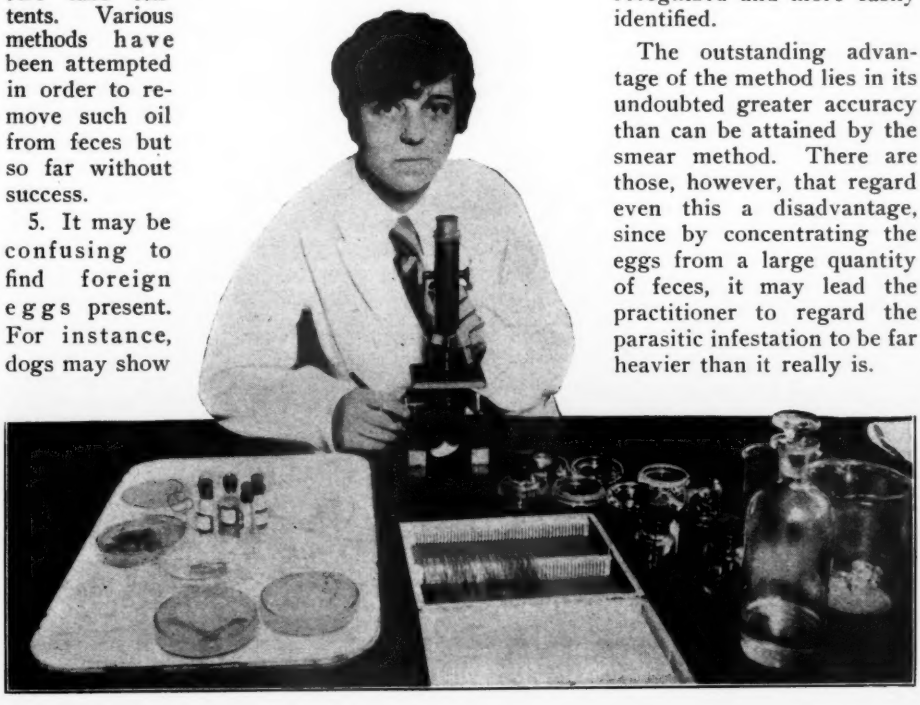
5. It may be confusing to find foreign eggs present. For instance, dogs may show ova of horse, pig or chicken parasites in the feces. This is no doubt the result of coprophagia.

6. Cleanliness of all utensils used is imperative, in order to prevent carrying eggs from one examination to the next. All tubes, rods, sieves and beakers should be thoroughly washed and brushed out as soon after using as possible. Wooden tongue blades should be used only once.

Other technicians give directions differing but little from the foregoing except as to the amount of feces used. Many regard one or two ounces of feses or even more as being more likely to give accurate results than a smaller quantity.

Although such directions may at first reading lead one to think that the examination is involved, it can be performed readily in five to ten minutes. In fact, those who use it say that the examination can be made quicker in this way than by the smear method since the field, being free of feces, the eggs can be more readily recognized and more easily identified.

The outstanding advantage of the method lies in its undoubted greater accuracy than can be attained by the smear method. There are those, however, that regard even this a disadvantage, since by concentrating the eggs from a large quantity of feces, it may lead the practitioner to regard the parasitic infestation to be far heavier than it really is.



# Some Sheep Range Problems

By DR. ROBERT DILL, Reno, Nevada
Inspector in Charge, Board of Sheep Commissioners

THERE are many problems, both of hygiene and diseases, confronting the range sheep industry. They include those of forage and water, diseases and vices of young lambs, poisonous plants, external and internal parasites, infectious and noninfectious diseases, and predatory animals.

### Dirt Eating

Among those diseases or conditions affecting lambs that are waiting solution, one is the problem of dirt-eating by young lambs. It seems that investigators are not agreed on the cause of this vice, which some years causes the loss of thousands of lambs. The eating of dirt, small rocks, sticks and other indigestible substances is begun by lambs from two to three weeks old, and usually leads to indigestion, bloating, toxemia and death. The cause of this vice does not seem to be due to a mineral or other deficiency in the mother's milk. It is worse some years than others and the character of the range or abundance or scarcity of wholesome, palatable forage does not seem to make much difference. Some years, young lambs in herds over wide areas start eating dirt and other indigestible substances. This habit may affect many lambs over many thousands of square miles of range one year and not very many lambs the next year. During the years of its greatest incidence the loss of range lambs from this cause may amount to several hundred thousand dollars in value. Sometimes the forming of this habit can be checked by simply moving the herd a mile or so to new range, while with other herds they can be moved to fresh range every day with no apparent check on the number of lambs beginning the habit.

In corral-raised lambs this vice can be largely prevented by feeding a grain supplement in troughs placed in lamb creeps, provided for that purpose. On the range such a practice is entirely impractical.

### Plant Poisoning

Throughout the entire year the range sheep industry is faced with the problem of poisonous plants. A great many of these plants are known, and can be avoided. New species of poisonous plants are being added to our list every year, but it will probably be many years before our knowledge of this subject will be complete enough for all practical purposes. We now know of a number of plants that are a quick and deadly poison when consumed by sheep at some season of the year, and the same plants are harmless and palatable for the same animal at other seasons. There are other plants where the leaves may be eaten with safety by the sheep when picked from the bush, while the leaves from the same plant after it has fallen to the ground in the fall, and becomes impregnated with alkali earths, is still readily eaten by sheep, but have become highly poisonous to them. Another plant, when growing on certain soils, will cause abortion of ewes in the later stages of pregnancy, if eaten in any considerable quantity. Other species of plants belonging to the same family are readily eaten by sheep but they seem to have a hemolytic action as where their diet contains any considerable quantity of these plants, sheep rapidly lose condition and become anemic. Other plants, when growing on most soils are the most valuable and nutritious forage plants found on the winter range, yet will become poisonous to sheep when growing in a highly nitrogenous and alkali soil. There are yet many problems relative to poisonous plants to be solved.

### Big Head

Among diseases of sheep waiting solution is typical bighead, probably of more interest to sheep-men of the intermountain country than any other disease. Typical bighead is a noninfectious disease of sheep and is characterized by a sudden swelling of the head and ears. The definite cause of bighead is unknown. It seems almost always confined to range sheep of the intermountain region, either while they are on their accustomed range, or after they have been moved to farms in other sections. It usually appears following a sudden change in temperature, such as a warm sunny day following a cold rain or light snow. It affects sheep when they are grazing at any elevation, from the low winter ranges to high summer ranges. The kind of forage eaten by the sheep seems to have no bearing on this disease. The species of plants that grow at low elevations are entirely different from those growing at higher elevations. A dozen or more herds may come over a certain range or trail without any of the sheep showing any symptoms of bighead, then a sudden and severe drop in temperature, or a cold rain or light snow fall, followed by warm sunny weather, and a number of herds on this same range or trail may show many cases of bighead. The death-loss from this disease is often quite severe; as many as six hundred head are sometimes lost in a single herd from this cause. The last few years this number of sheep lost would mean a loss of $8,000 or $9,000 to the owners. Many lines of medicinal treatment has been tried without much success, if any. The empirical treatment of quickly rounding up the herd when the first symptoms of bighead appear, and then holding them quietly; if possible, in a cool or shady place for a few hours, seems to give the best results of any treatment so far tried. A practical prevention and treatment of bighead of sheep would be welcomed by western range sheep men above all other problems in connection with sheep diseases.

There are cases of atypical bighead which may follow eating spoiled, mouldy or otherwise unwholesome forage. There are other cases of atypical bighead which follow eating certain plants of the buckwheat family, but these cases do not present the problem that typical bighead presents.

### Ictero-hematuria

Ictero-hematuria is a highly fatal disease of sheep that presents a serious problem to the sheep-man of certain sections of the Rocky Mountains. In Roumania the disease is said to be done to the *Piroplasma ovis*, transmitted to the sheep by a sexually mature tick *Rhipicephalus bus* In this country its cause is unknown. It is, however, a rapidly fatal disease of mature sheep. It rarely, if ever, affects lambs. In some affected herds it may cause a loss as high as 30% of all mature sheep. There is apparently no known prevention or treatment for this disease. A line of preventative treatment or control that is successful in one affected herd may fail on the next herd where tried.

These problems and many more are awaiting solution by the range sheepmen of the west, but space does not permit discussion of them now.

**Leaving the Home Ranch to Trail to the Range.**

# Report of a Case a Day

By S. L. STEWART, Olathe, Kansas

## Impotency Due to Improper Diet

*First Day.* Because of impotency, a small dairy herd of mixed breed recently came under my observation. The case is of more than two years standing and is interesting.

In December, 1927 the owner informed me that some of the cows were aborting and that the entire herd of 26 cows had seriously dropped in milk production. I suggested a thorough examination in order to ascertain the cause, but heard no more from him.

In February, 1928, or about three months later, the owner of the herd had a public sale and sold everything he possessed at public auction. A city man desirous of operating a dairy bought at this sale 18 cows, rented the same farm and started operations the day after the sale.

Within a short time the new owner consulted me regarding abortion and sterility, following which a visit to the dairy farm was made.

The history that the new owner gave was that five cows out of the 18 would not conceive, that two others had aborted, and that all the cows were low in milk production and thin in flesh. The symptoms of nutritional deficiency (a lack of vitamins B. E and D) in all the cows and the bull were evident. The owner was advised to feed a balanced ration with the addition of vitamineral at each feed. The cows were not even being fed a maintenance ration of ground corn and cob meal and timothy hay. But the feed was not changed or increased in amount.

The owner insisted on treatment for abortion and sterility. Each of the five cows were examined for sterility without finding pathological causes. Blood for agglutionation test was taken from the seven cows and the bull, which proved to be negative. The owner, believing the bull sterile, proceeded to sell him and replaced it with another bull, which did not bring improved results.

In April, 1929, a large holstein cow was bumped on the shoulder by another cow and a hematoma as large as a two gallon bucket appeared behind and beneath the triceps. This was properly reduced and treated and the cow seemingly recovered.

In September a bull calf some three months old, which the owner was keeping for a herd bull, developed osteomalacia, was treated, and "in a way" recovered. By this time the third bull was heading the herd, with the same bad results of the two preceding bulls.

In October I was called again to treat the cows for sterility. The cow that I had treated in April for the hematoma was examined but no pathological condition was found and I did not treat her. The next day, I was called again to see the same cow as she was reported sick. Upon arrival the cow was dead. Autopsy disclosed death was caused by internal hemorrhage, as there were several gallons of clotted blood in the peritoneal cavity. She was also pregnant, of three or four weeks standing.

The owner still owns the herd, but buys most of his milk for retailing. The herd is in bad condition and has not paid one-fourth of the cost of the feed bill since last summer. But the owner can not be induced to believe that it would pay him to feed a balanced ration and vitaminerals. This herd is ripe for an outbreak of hemorrhagic septicemia, or pulmonary edema or some other infectious disease, and if and when it does start, it will go fast because of the lowered resistance.

Since Kansas City has the best market milk ordinance of any city in the United States, it will be well to explain why a monthly examination and a semi-annual tuberculin test are not made on this herd, which would prevent the milk from being sold. There are large centers which are really small cities containing many hundreds of people, lying outside the city limits. Seemingly no one has jurisdiction over the sale of milk to these people and there is where the milk from this herd is sold.

**Caesarean Section—500-Pound Sow**

*Second Day.* Paraphernalia—small block and tackle, shackle rope, a heavy barn door, 7 to 8 feet long, placed with one end elevated, and a makeshift table for instruments, plenty of water, in two or three buckets, large apron to cover entire sow, containing an operating window, one pound of chloroform, anesthesia sheet, tincture of iodin, 6 oz., antiseptic for operating instrument pan, 4 to 6 hemostats, one pair curved scissors, one pair of straight scissors, one scalpel, 3 full-curve needles, 1 large spaying needle, 1 regular size half-curve needle, all threaded, 1 razor to shave the flank.

Then, with everything ready, the shackle rope was placed on the hind legs above the hocks, and with block and tackle the sow was raised to position on the operating table (the barn door) and anesthetized. The right flank shaved; the tincture of iodin was applied and allowed to dry and a perpendicular incision 6 to 7 inches long made in the middle of the right side, cutting through the skin, fat and down to the aponeurosis of the internal oblique. Then with cotton and hemostats, all hemorrhage was stopped. Tincture of iodin was applied and after mopping up the excess iodin, the aponerosis and peritoneum were incised. Then after washing the hands with pure bathing alcohol, both horns of the uterus were lifted and laid on the operating apron, which had been well soaked in an antiseptic solution. An incision on the top side of the uterus was made. (If the uterus is too short to come through the abdominal opening, two incisions must then be made, one in each horn.) One dead and seven live pigs were removed.

In some cases, after the horns of the uterus are laid out on the operating apron the pigs can be forced backward and removed through the natural channel, if one has an assistant with a small hand. But where one must do the operation alone, it is advisable for the operator to keep his hands clean, and do the complete Caesarean operation.

Suturing up the wounds finished the operation. Suturing the wound in the uterus is a very particular operation. It must be sutured in such a manner that it will not leak fluid. Two rows of stitches are used. First, the continuous Lembert suture, second, the Lembert suture minus the mucous membrane. The uterus is then washed by pouring over it a 2% solution of aseptogen, and replaced in position. The abdominal wall is next to be sutured with three rows of stitches, first, with the curved needle and catgut, suturing the peritoneum and aponeurosis, second, with strong Irish linen thread and a curved needle, running five to six stitches loosely in the musculature only. The last row is run with a big half curved spaying needle and a double twisted Irish linen thread, the interrupted stitches passing through the skin and deep into the fat and muscles. As each stitch is drawn, the muscle suture beneath is also drawn. This continues until the wound is closed, thus bringing the edges of the entire muscles together at the same time the skin is drawn together.

Tincture of iodin is then applied to the wound, the sow let down by the use of the block and tackle, which has been in use all this time in holding the sow in position. The barn door is usually slipped down underneath the sow at the same time she is lowered, in order to let her down more easily, and the operation is completed.

This sow made a fine recovery and is raising her seven live pigs.

**Retropharyngeal Tuberculous Abscess.**

I do not believe that results from Caesarean operation are what they should be, as my experience is that only about 50% live following the operation. However, I also know that the operation is done too late in some cases and also in a very unsanitary and sometimes a dusty place.

### Death of Cow by Drowning

*Third Day.* A fine holstein cow calved in the pasture and was not found for some hours afterward, when she was then cared for and milked. Later in the day she was found down with milk fever. The cow was treated late in the evening. The next morning she was at the barn to take her place with the other cows. The second morning she again was unable to rise. The owner attributed her condition to paralysis caused by constipation and gave her a drench of salts. Soon afterward I was again called to see the cow and found her with a second attack of milk fever, with at least a large part of a half gallon drench in her lungs, from which she did not recover, and died within a few hours after it was administered.

### Death Caused by Congestion of Lungs

*Fourth Day.* An extra good grade jersey cow was moved to calve from a small barn with a tight, dry board floor into a very wet basement of a rock barn with a dirt floor late one cold evening. The next day I was called to see the cow. She was standing up and did not like to be moved, showed an anxious expression of countenance, some muscular trembling, the head extended, the nostrils dilated, a slight hemoptysis, the heart rather rapid and a temperature of 104° F.

The diagnosis was acute pulmonary congestion and the prognosis unfavorable.

Treatment consisted of moving her back to the little barn on the board floor, blanketing well and giving a laxative, and of the following prescription:

| | |
|---|---|
| ℞ Guaiacol | 1℥ |
| Strychnin Sulphate | 4 gr. |
| Fl. Belladonna | 4℥ |
| Water q.s. | 16℥ |

M. S. Give one ounce every two hours.

The cow was also vaccinated with pulmonary edema bacterin as a precaution against pulmonary infection.

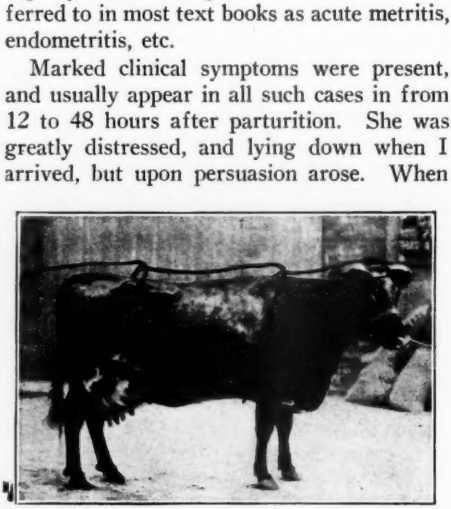
The symptoms mentioned above all increased in severity rapidly, with the lungs rapidly filling with fluid. In 30 hours she would hold her mouth open in order to obtain a greater breathing capacity, the lungs filled with exudate and the cow died from asphyxia in about 36 hours from the onset of the first symptoms observed.

I am reporting this case because of the unusually rapid progress of the disease.

### Acute Toxemia in a Mare

*Fifth Day.* An 1,800-pound Percheron mare developed acute toxemia the following day after foaling. This condition is referred to in most text books as acute metritis, endometritis, etc.

Marked clinical symptoms were present, and usually appear in all such cases in from 12 to 48 hours after parturition. She was greatly distressed, and lying down when I arrived, but upon persuasion arose. When



**When it is necessary to cast a cow in advanced pregnancy, it should be done with the greatest care, not only for the protection of the animal, but for the sake of the owner as well. Owners, particularly of fine cows, usually resent greatly the slightest appearance of rough handling.**

**The illustration shows a very simple means of throwing a cow gently. In fact, of inducing her to lie down almost of her own accord. The halter should be tied near the ground to something solid, such as a post. Then traction applied on the extension of the rope at "A." Be patient and pull gently for a minute or two until the animal gets over her fright. When recumbent, she may be kept in this position with a minimum amount of struggling by keeping the rope taut.**

moved she showed clinical symptoms of puerperal laminitis. There was failure of appetite, pulse big and round but weak. Her temperature per rectum was 102.8° F, per uterus 104.8° F. A dirty grayish pus, flecked with blood, was discharged from the vulva involuntarily. Manual exploration of the uterus revealed a paretic organ, containing two or three gallons of fetid fluid.

Treatment was applied energetically at the first call, which is positively necessary. The treatment aimed at three distinct objects—first, to prevent further absorption of toxins; second, to support or stimulate the patient; third, to eliminate the toxins already absorbed. The cause must be removed, and this will be found within the uterus. By carefully passing the hand into the uterus and forming it in the shape of a scoop, with the efforts of the mare, large quantities of fluid and debris was removed at each manual effort, until the entire amount was apparently removed. It is of importance to remove all septic material present. In this case four 1½-oz. capsules filled with boric acid were placed deeply into the uterus, followed with a 6cc hypodermic injection of pituitin. Four bran sack boots were placed on the feet and the owner instructed to soak the boots with cold water every half hour. The mare was well blanketed, to induce external heat, and as the day was rather cold, she was tied at the side of the barn in the sunshine.

In eight hours I called to see the mare again; found her standing up eating hay, temperature 101° F, laminitis much reduced and the general attitude greatly improved. She received 6cc of pituitin. The next morning the owner reported the mare seemed to be well, and she made a complete recovery.

I have used this treatment several times every spring during foaling season and find it almost 100% perfect.

If the pituitin is injected first, before the uterus is properly emptied of its contents, uterine contraction sometimes greatly interferes with the work. It is interesting to know how decidedly contracted and smaller the uterus becomes within a short time after treatment, and how quickly vaginal discharges cease and the mare recovers.

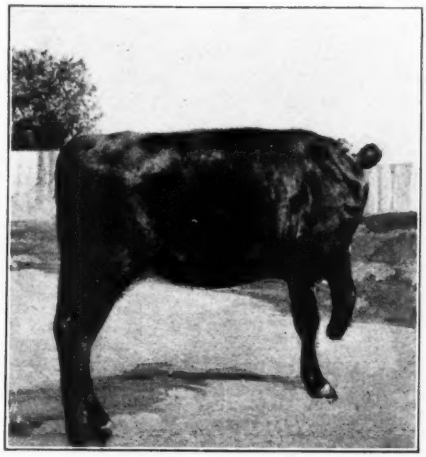
### Pyonephritis—Cow

*Sixth Day.* A large holstein cow had gradually fallen off in milk production and rapidly declined in flesh.

Upon entering the cow barn I observed her physical condition and that she had not eaten all her feed. Her general attitude was that of a cow with traumatic indigestion. But upon further observation, followed by a thorough examination, these symptoms were observed: appetite interfered with, emaciation progressing rapidly, back slightly arched, while examining the heart I thought I could detect strong urinous odor. This was followed by a rectal examination which revealed the left kidney fully as large as a gallon bucket. The character of the urine was examined and found to contain blood and pus.

The prognosis was unfavorable and the owner advised to send her to slaughter.

In diagnosing kidney diseases, one may be misled and a mistaken diagnosis easily made, as the symptoms of renal diseases are generally obscure, but there are certain phenomena present in most cases which are suggestive, that lead a practitioner to a correct diagnosis if one is careful to observe the phenomena.



**Amputation in a Steer.**

### Mad Itch in Dairy Cows

*Seventh Day.* A large holstein cow close up to calving time was putting on some stunts that attracted the attention of the foreman, and I was called to a case of obstetrics.

After loading all my obstetrical paraphernalia in the car I drove to the farm. Upon arrival at the barn where the cow was inclosed to calve, having been placed there after she begun to exhibit the symptoms, I observed some very interesting symptoms.

The cow would arch her back and go through some peculiar actions, then soon she would reach back and skin the hair off over the hips. She had a wild look from the eyes, would sling the head and act as though she had a notion to charge us. By this time the foreman thought that perhaps it was rabies instead of obstetrics. I asked to see the other cows. There we found a white cow that was simply skinning her hind legs and hips with her teeth, being white and her head bloody, she looked rather fearsome as she showed some signs of charging us. By the time we got this cow corralled in the same barn with cow number one, number one cow was skinning her legs in a furious fashion.

A diagnosis of mad itch was made, and we proceeded to treat these two cows. They were tied up in the barn in two directions, to prevent them from doing more harm to themselves, and each was given 18cc of hemorrhagic septicemia bacterin. The entire hind quarters were washed with a hot antiseptic solution and the foreman told to place an observer with the other cows to note if more cases developed—if so, the entire herd would have to be treated.

At 6 A. M. the next morning he called up to report that the two cows we treated the day before were dead and that no more cases had developed. At 9 o'clock he called again and told me that three new cases had developed. I advised him to prepare to vaccinate all the cattle. At 10 o'clock, when I arrived, there were five cases of mad itch developed, but the men had succeeded in getting them stanchioned and they were not badly mutilated. Some 60 head of cows and some heifers—85 head in all—were vaccinated, giving the cows 12cc of bacterin and the yearling heifers 6cc. The five cows that were affected were given a drastic saline purgative and their hind quarters were washed with antiseptic solution:—Two ounces of auseptogen to one gallon of warm water. They were bathed three times that day, and were retained in the stanchions until the next day, when the symptoms of mad itch had disappeared. No more cases developed and no losses occurred except the first two cows.

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### Cerebral Toxemia

*Eighth Day.* A very good jersey yearling heifer was fastened up in a barn and the doors barred, and upon my arrival the owner was so badly scared that he could hardly be induced to go with me to the barn. The heifer had taken him for a knock down and he was through. He thought the heifer had rabies and wanted her shot then.

Being careful not to attract her attention, we saw some very unusual symptoms. The heifer was standing in the center of the cow barn and with her nose would start from the ground up a post with a hunching movement of the head and would shove it up the post so high that she would almost fall over. She would regain her posture and repeat the same symptoms all over. There was excessive salivation caused by the smacking movements of her mouth. This was repeated again and again, until we opened

the top door of the barn and she came pell-mell and butted the side of the door so hard that she knocked herself down. We closed the door and watched her and she started the same antics again; this time up the door.

We proceeded to rope the heifer with two ropes and with care removed her to a pen with a high fence. There she was snubbed and was given 18cc of hemorrhagic septicemia bacterin and turned loose in the pen, where she then put on a show for a while.

The next morning the owner called up and said that the heifer was all right and he had turned her out with the other cattle.

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### Toxemia Complication of Retained Afterbirth in Cow

*Ninth Day.* A shorthorn dairy cow aborted at eight months of pregnancy. The owner, thinking that the afterbirth had passed, did not notice anything particularly wrong with her until the fourth day after the abortion, as the retained fetal membranes were not visible.

Observation revealed the fact of the presence of necrotic and putrefying mass of membranes and that saving her life depended upon removal of the cause of the toxemia at once.

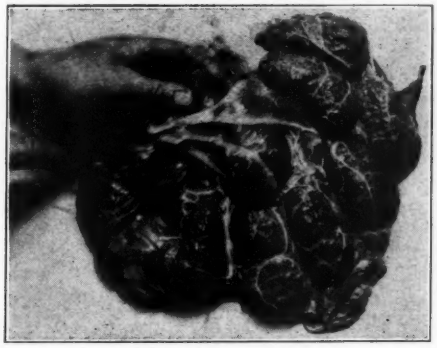
The bull lead was placed in her nose, drawn taut, the rope then tied to the manger. The entire buttocks were thoroughly washed with antiseptic solution —my arms thoroughly covered with antiseptic oil:

℞ Auseptogen, 1℥,
Stanalax Oil, q.s., 16℥,

which I consider par excellence, and preferable to anything else.

I proceeded to remove the contents of the uterus. As in most all cases of toxemia following retention of the afterbirth, the uterus was decidedly paretic, large and flaccid, and the cervix almost closed. I am a firm believer in removing the cause, if possible. In such a case it is only after the removal of the fetal membranes that one can handle with any directness the fundamental metritis which causes the retention and then stop the absorption of toxins. Even though the danger to the cow's life is aggravated when the closed cervix is forced to relax, it is positively necessary and must gently be forced until relaxation sufficient to admit the hand and arm is induced, and then proceed to properly remove the debris.

After the membranes and fluid were removed, four 1½-oz. capsules filled with boric acid were placed deeply into the uterus. A 4cc dose of pituitin was given hypodermically, the cow given a one-ounce capsule of fluid extract of capsicum and oil, equal parts, containing one-half grain of strychnin, and then blanketed as the cow was suffering greatly from toxemia and would stand up only a short time. I visited her again in about 10 hours, found her lying down, still very sick, without visible signs of improvement. She was given 6cc pituitin and a dose of medicine:



**The proper position of the hands in removing an afterbirth. Also showing the left hand in the act of squeezing the cotyledon so that its size may first be reduced and then the rolling process with the thumb to detach the placental cotyledon from its maternal cotyledon.**

℞ Strychnin Sulphate, 4 grs.,
Fl. Digitalis, 4℥,
Fl. Calabar Bean, 1℥,
Water, q.s., 16℥.

M.

S.—Give one ounce at a dose every hour.

The cow received the medicine according to directions during the night. She was also well bedded and well blanketed. The next day she showed decided improvement, drank some luke-warm water, another 4cc dose of pituitin was administered and the above medicament was administered every two hours for the next 24 hours, when she began to eat alfalfa. With good care and three doses a day of

**Illustrating how firmly and closely the afterbirth of an eight months pregnancy adheres to the maternal cotyledons.**

the same medicine, she made a recovery.

This is one of the very unusual cases one finds in practice, but the symptoms are distinct, shown by a rise of temperature to about 104° to 106° F., or even higher, but always remaining high in the early stages. The respiration is rapid and shallower than normal. The visible mucous membranes are dirty red or reddish-yellow, the pulse rapid and weak. The appetite and secretion of milk fail, the udder and teats usually become cold and flaccid. Muscular twitching is common. A pronounced stiffness, and in severe cases, a staggering gait. There is dullness and weakness, and rapid loss of flesh. The back is arched, the legs somewhat drawn together. The head is carried low and the expression is anxious.

When these symptoms are observed, heroic efforts and treatment must be resorted to at once, as the prognosis is doubtful at the best.

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### Impaction of the Omasum

*Tenth Day.* A 7-gallon two-year-old Holstein heifer refused her evening meal and gave only a small amount of milk.

When a thorough examination was made, a diagnosis of impaction of the omasum was given. The condition is not as common as other digestive disturbances and is rather obstinate about yielding to treatment. However, a case rarely dies if it is treated soon after the symptoms appear.

Three gallons of real warm water were obtained, in which a can of bovine purgative containing 60 grs. gamboge, 60 grs. capsicum, 60 grs. pwd. ginger, magnesium sulphate q.s. 20 oz. was dissolved, and pumped into the stomach. In cold weather such cases must be well housed, well bedded and well blanketed. She also received a hypodermic of labolin sulphate ½ gr., and philocarpin ¼ gr.; then the following prescription:

℞ Strychnin Sulphate, 4 grs.
Fl. Calabar Bean, 4 ℥
Fl. Capsicum, 1 ℥
Water q.s., 16 ℥

M.

S.—Give two ounces at dose every four hours.

Four purgative capsules containing:

℞ Powd. Aloes, 160 grs.
Barium Chlorid, 65 grs.
Colocynth, 2 grs.
Nux Vomica, 15½ grs.
Podophyllin, 2 grs.
Carminatives and Aromatics q.s.

M.

S.—Give one capsule in 24 hours and repeat in 48 hours until the four capsules have been given.

The cow made a complete recovery within 10 days and was milking nearly up to normal capacity.

Some judgment must be used in giving the purgative capsules as some cows will need more than others and some cows purge more easily than others.

## TETANUS IN A MARE

This half thoroughbred mare with a young foal, about three months old, by a thoroughbred sire, was running on pasture since she had the foal. She was never stabled then.

One morning she was noticed to be stiff and walked in a peculiar manner. From the description given, I diagnosed tetanus, and took along with me 30,000 units of tetanus antitoxin. The antitoxin is supplied by the Government at cost price, which is $7.00. The owner had to think a long time before deciding to give the antitoxin, as he wanted me to inform him positively if it would cure her. This I could not do, and I told him that it might take many more doses, and then she might die.

However, he said to try my best as the mare was a first class racer and he would like if possible to get a few foals from her. I used to ride the mare sometimes when she was in training and I had and still have a liking for her.

She was given the 30,000 units that day and 30,000 more the next day, but on the third day, she appeared a little worse, and as I did not wish to run up the bill, I told him I would not bother to give any more antitoxin.

However, I suggested putting her on chloral hydrate, bromid of potash and fluid extract of belladonna. This mixture was given in water to which was added oil meal and molasses.

On the fourth and fifth days she appeared brighter, and I suggested to repeat the mixture, and give her another dose of the antitoxin, which was done. I did not pay any more visits as it was reported she was doing well.

This mare was allowed to do whatever she liked while sick. That is, she was never tied up, but walked about with the other horses. There is no stable on the place. The horses are out day and night, rain or shine. For over a year now, the mare has been brought in to town, and is used as a riding horse around the estate. The antitoxin was given subcutaneously.

St. Kitts, B. W. I. E. F. Jardine.

## HEMORRHAGIC SEPTICEMIA OF SWINE DUE TO EATING INFECTED CARCASS

On February 26, 1930, a carload, 58 head, of yearling steers was purchased in Kansas City and shipped about 100 miles, where they were placed in a feed lot. About March 5th, three steers refused to eat, and when they were examined they were found to have temperatures of 104.5°, 105.2° and 105° F., respectively. When exercised they coughed and evidenced a nasal discharge. One of these steers died on March 8th, was skinned and the carcass was loaded onto a sled and hauled to the hog lot on March 9th.

There were about 100 hogs in this lot, all apparently healthy. They had been vaccinated for the prevention of cholera for some time. On March 12th, three days after access to the steer carcass, several of the 60 to 80-pound shotes were noted to be coughing. These hogs were carefully inspected on March 15th and some thirty head were found to be affected. The principal symptoms were a mild conjunctivitis, cough and a rise of temperature. They all ate, but those affected did not eat heartily. Practically all affected evidenced pronounced thumping and they were gaunt and, according to the owner, they were shrinking.

Three of those apparently most seriously affected were destroyed and carefully autopsied. They all evidenced pleurisy with adhesions, atypical, catarrhal pneumonia, tumefaction and congestion of the mediastinal and bronchial lymph glands, and petechial hemorrhages on the pericardium and epicardium.

From the post-mortem findings and the clinical manifestations, the malady was diagnosed swine plague or pulmonary hemorrhagic septicemia.

The rate of progress of the disease, the fact that all affected swine ate and the character of the cough eliminated "flu."

The interesting problem is the possible transmission of this disease by eating of the carcass of a steer that had died of hemorrhagic septicemia.

Kansas City, Mo. A. T. Kinsley.

## ABORTION IN SOWS

Am writing you for information and advice on the following condition: This condition is in a registered spotted Poland China herd of sows. These sows made the show circuit, Sedalia, Topeka, Hutchinson, etc., in the fall of 1929. There were no losses or unusual difficulties in the 1929 fall litters. These sows and gilts, ten in number, range in age from 18 months to two years. They have been fed one bushel of ear corn (some immature and mouldy near cob) and two to three pounds of tankage daily, with alfalfa hay and an occasional feed of oats, They have had constant access to salt and ample exercise.

All of the sows are in a thrifty condition, but not fat. Seven out of the ten sows have aborted from four to thirty days prior to farrowing time, one sow has a living litter and there are two yet to farrow. One sow aborted nine pigs today, four days prior to farrowing time. Of the nine pigs one only was alive, and one was practically mummified. Agglutination test reported negative to the *Br. abortus* Bang.—I. J. P., Kansas.

**Reply**: From the history it is evident that the feed, although the corn was not of the best quality, is not the cause of the trouble. The fact that the blood sample gave a negative reaction to the agglutination test for the *Br. abortus* Bang, apparently eliminates that infection as the causative factor. However, bear in mind that a negative reaction may occur in infected animals if the blood is obtained within thirty days after aborting.

Abortion in sows and the farrowing of dead pigs at the normal farrowing time is of common occurrence in sows that have had an attack of "flu" after having been bred. This may account for these losses.

Metritis caused by various organisms, streptococcus, staphylococcus, colon bacillus, etc., is relatively common in sows and is responsible for extensive losses either as abortions or the farrowing of pigs of low vitality the most of which soon die.

If these sows had an attack of flu or are affected with infective metritis, it will be advisable to correct that condition before they are bred for the fall litters, otherwise further losses will probably occur at that time.

The treatment given will depend upon the nature of the infection and the extent of involvement of the uterus. In some instances it is most economical to fatten and dispose of the sows by slaughter, in other cases they respond readily to bacterins, particularly autogenous bacterins.

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## ANEMIA IN PIGS

The early investigation work established the fact that the occurrence of anemia in pigs kept under the usual outside conditions, is less than in pigs kept in buildings and central hog houses. Later work has definitely shown that certain litters, one day of age, may show a low percentage of hemaglobin. The death rate in such litters may be high, and the pigs that live do not thrive. We have also demonstrated that pigs decidedly anemic are more susceptible to such infections as "bull nose," than non-anemic pigs. It would appear from these experimental findings that more attention should be given to the feeding and care of brood sows, and that a large part of the death rate and loss in young pigs which result from anemia can be prevented.—R. A. Craig, Purdue University, Lafayette, Indiana, in Animal Pathology Exchange.

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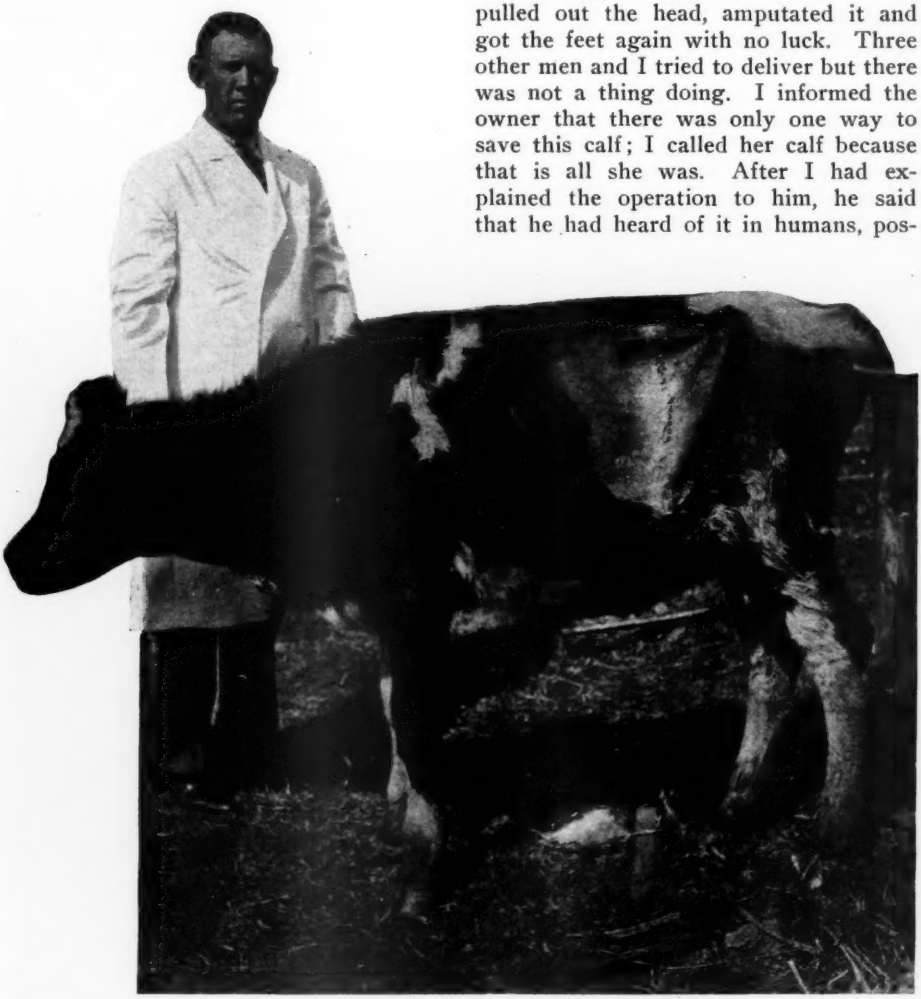
Probably the farmer's greatest problem in connection with housing poultry is to convince himself or the landlord that poultry are worth a decent house. Too few people appreciate the importance of good housing for poultry. In fact, many times an effort is made to secure good birds, good feed, and to provide everything else necessary for success except to provide a decent poultry house.—H. H. Alp, University of Illinois, in Animal Pathology Exchange.

## CAESAREAN SECTION IN A VERY SMALL COW

The illustration is of a calf on which Caesarean Section was performed in my hospital, April 7, 1930. The picture was taken the next day after the operation, which was followed by complete recovery.

I have been practicing fifteen years and this was the first calf, in the role of dam, that I ever delivered. She was supposed to be a shorthorn and Holstein, but I think a Jersey had run through her grandmother's back yard sometime. She was just thirteen and one-half months old, and would weigh only about 425 pounds at the time of operation, being very thin as the illustration shows.

I was called about six P. M. and made an examination. I found the calf very badly twisted up. After some very hard work, I succeeded in extending the fore legs with no success. I then pushed the feet back, put hooks in the orbits and pulled out the head, amputated it and got the feet again with no luck. Three other men and I tried to deliver but there was not a thing doing. I informed the owner that there was only one way to save this calf; I called her calf because that is all she was. After I had explained the operation to him, he said that he had heard of it in humans, pos-



**Caesarean Section in a 13-month-old Heifer.**

sibly in stock, but "you just as well knock her in the head for it can't be done."

I knew if I could get over with this operation, that it would mean considerable to me as the owner is a very influential man in the community. After some thirty minutes urging, he consented to the operation and I helped load the calf in a ford truck, and it was taken to my hospital, a distance of 10 miles.

I performed the operation under a local anesthetic, using novocain with the best of luck. At no time did she make a move. I was just forty minutes operating and delivered a 35-pound calf. The calf (the smaller one) was out of a 1,400 pound shorthorn bull and the only thing I regret is that I did not operate at the first and save it. I held the calf (cow) at the hospital for just a week and she never missed a feed. I have performed this operation on several cows, but this one was the youngest and by far the smallest.

E. B. Masters.

Okmulgee, Oklahoma.

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## IT'S ALL IN A LIFETIME

A few years ago I was called five miles in the country to see a good grade Holstein cow that had been ailing for several days. The owner had administered epsom salts in two-pound doses for several days without inducing purgation. When she started to go around in a circle he called for me to save his cow. I explained the conditions present as she was a very good feeder and had been turned to the straw stack for roughage and her stomachs were in a terribly impacted condition. I gave her one gallon of mineral oil and followed with barium chlorid and tarter emetic tablets, 30 grains each. I advised him to crush two tablets and give suspended in one quart of water every six hours to effect. I called next day and used arecolin hypodermically and prescribed strychnin in solution per os every six hours. No improvement resulted from this treatment.

I also bled her from the jugular vein to relieve the brain symptoms, etc. I told them on the first visit, it was a hopeless case. I made five or six trips to see this cow when the farmer's wife phoned me, if I wanted to treat this cow and guaranteed to cure her, she would be willing to pay me $25.00 and if she died, I was to make no charge. I told her I could not practice on such terms especially since I had already rendered services to that amount. I told them when she passed out to phone me for an autopsy which I would perform without charge. In a few days they called me and said the cow had died.

The autopsy proved my diagnosis correct, and I left them as I thought very well pleased. They made no inquiry as to my account, and in due time I sent a statement for professional services and medicine, autopsy gratis. My account was $25.50. I received a check by return mail, no letter enclosed. They had written on the check, as large as it possibly could be written: "FOR ONE DEAD COW" and underscored it.

This couple is well to do. The farm was given to the husband by his father, a very valuable farm, and the wife will inherit considerable property from her father, probably soon. It is a well thought of family.

Did I do right by charging as I did? My conscience is clear and I would do the same thing over, but this kind of treatment from a client takes the joy out of life. It is not uncommon, many people are so little and do not appreciate the services of a veterinarian. I have received a great deal of this kind of discouragement in the past twenty-six years, and I'm beginning to get "shell shock" from it. I would like to see other's report their experiences along this line and tell what, if any, antidote they have discovered for such lack of appreciation.

Uhrichsville, Ohio. G. U. Marchand.

# Reviews and Abstracts

## Effect of Rectal Douches in the Horse in Softening Impacted Fecal Matter

Based upon numerous experiments Richters[1] shows that copious amounts of water injected per rectum reach the right upper flecture of the colon. Small amounts of water have no value whatever.

Copious rectal infectious masses may move which are hardly ever affected by any drastic purgative.

With regard to the small intestine and the cecum they can never be reached by rectal injections no matter how large an amount of fluids one injects.

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## A Case of Bone Tuberculosis in a Horse

Hyperleucocytosis is an almost constant symptom of tuberculosis in the horse. It was present in this case although Butsch[2] confirmed the diagnosis by a positive tuberculin reaction. A rise in temperature up to 39.2 C. (102.5 deg. F.) for over 24 hours after interpalpebral injection was considered positive. A peculiar symptom was that the animal could not bend its neck on account of a unilateral muscular atrophy and a fixing of the vertebral column.

Upon postmortem examination a degeneration of the bones and periosteum of several ribs was found as well as tubercular lesions in the intestinal lymphglands. In the region of the third to tenth vertebra osseous proliferations with neoformations in the joints was seen. The proliferations were filled with reddish greyish spongy granular tissue.

[1] Richters, Prof. Dr. *Zeitschrift für Veterinärkunde*, Berlin Heft 10 and 11, 1928. Bis zu welchem Darmabschnitt gelingt beim Pferde die Erweichung des Darminhaltes durch grosse vom Hastdarm aus infundierte Wassermengen?—Abst. by H. J. Magens.

[2] Butsch, Dr. *Zeitschrift für Veterinärkunde*, Berlin. Heft 10-11, 1928. Ein Fall von Knochentuberkulose bei einem Pferde.—Abst. by H. J. Magens.

[3] Seelemann and Bischoff: Uber einen Fall von langanhaltenden Blutmelken mit Heilung durch Luftinfusion. *Tierärztliche Rundschau* 1928. Nr. 40.—Abst. by H. J. Magens.

## Udder Inflation, a Cure for Chronic Blood Milkers

The authors, Seelemann and Bischof[3] report treating a cow which for some unknown etiological factor had been giving bloody milk for over a period of six weeks. The treatment consisted of inflation of the udder. It seems the first two times inflation was not carried far enough for two relapses occurred. Most likely the bloody milk was due to hemorrhage from an injured vessel which due to the pressure of the air became temporarily sealed for some hours, and complete closing of the vessels occurred.

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## Value of Vitamins in Feeding Cattle

Although it is only recently that vitamins have been recognized, studied and classified, they have been known instinctively for a long time as the something causing feeds to be palatable, in reality nourishing, etc. Modern researches have shown definitely that they influence the animal metabolism favorably in many ways. Experienced animal husbandmen have long known the same thing empirically. Four principal kinds of vitamins are recognized as follows: Vitamin A, the growth promoting vitamin; Vitamin B, which increases milk production (lakto-vitamin); vitamin C, prohibiting ceratomycosis, which shows in chickens in nasal catarrh, inflammation, small yellowish pustules upon mucous-membranes, on the esophagus and the trachea and vitamin D, the anti-rachitic vitamin, which regulates the calcium content of the body.

With regard to the cattle vitamins A, B and D are the most important, since they increase the yield of flesh and milk and prevent the softening of bony tissues.

Vitamins, according to W. Koppitz[4] can not be expressed in percentage figures as can other nutritive components of our feeds. Knowledge of their presence is based upon

[4] Koppitz, W. *Prager Archiv für Tiermedizin und vergleichende Pathologie.* Vol. IX. No. 8 part B. August 15, 1929. Die Beurteilung der Vitaminé bei der Fütterung der Rinder—Abst. by H. J. Magens.

practical results, i. e., upon observation as to whether the feed is eaten and relished and used gainfully which is shown in production, health and physical condition. Since a larger part of agricultural endeavors is now substituted by animal husbandry of some sort due to late economical developments much more care and effort is concentrated upon the latter. Observations may be made daily that even the owners of the smallest herds now not only choose their feedstuffs with regard to nutritive factors and components but also with regard to palatability and digestibility so that the animals receive the largest quantity of vitamins possible under given conditions.

The extremely long time the author has been in close connections along veterinary and advisory lines with large industrial agencies such as distilleries, dairies, beet sugar plants, with intensive beef or milk production activities has given a large experience and a great opportunity to gather information on the selection, examination and judging of feeds and feed-substitutes and in planning feeding schedules.

Green feeds are very extensive carriers of all sorts of vitamins. Roughage and dry feeds have much less. Winter straw of all sorts has hardly any vitamin content at all. Small grains, corn, etc., are also rich in vitamins as well as proteins. Beets, carrots, etc., are again rich in vitamins. Potatoes, either raw or cooked, contain much starch but very few vitamins.

Of the agricultural-industrial plant residues and wastes large vitamin contents are found in cornstarch manufacture; in mash and residues of distilleries using grains and in malt, mash, etc., of the large breweries. Residues from distilling plants using potatoes and from potato-starch manufacture are very far behind the others in vitamin value. Silage-feeds are rich in vitamins. The various oil cakes offered through the trade are not only valuable for their vitamins but also for their protein contents. In mixed feeds the contents vary with the contents of the mixtures. Meals made from meat, fish or blood all have a high protein content but are very poor in vitamins.

With regard to the vitamins one must say that they are as essential to the lives of the animals as starches, fats and proteins, nitrogenfree extracts and minerals. This was brought out forcefully during 1928 when the harvest suffered very much from extensive drouth. A failure of the hay crop resulted in underfed cattle. Potatoes had been frozen and were not plentiful, even the grains were not of a high grade. Conditions of the animals became poor. Losses were seen even where the owners fed ground feeds they had raised themselves. If feeds rich in vitamins were added oil cakes, etc., or good hay or any one of the common mixed heavy feeds rapid improvement in performance and physical condition was experienced.

It may be said that without vitamins there is no thrift, no growth, no performance and no life.

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### Observations on the Success of the Veronoff-Operation in Algiers

On the occasion of the celebrations in honor of the Prof. Dr. Th. Schmidt, the well-known director of the Surgical Clinics at the State Veterinary College of Austria at Vienna, Prof. Pardubsky,[5] who is in the same capacity at the National Veterinary College at Brünn, Czecho-Slovakia Republic, gave out a report on this operation in Algiers. The report is based upon reports to the Minister of Agriculture of the Republic by the author, who observed the effects of the Veronoff-operation in Algiers, French Occidental Africa.

The Veronoff-operation consists in the transplantation of four segments of testes of another individual of the same species and type into the scrotum of the animal to be rejuvenated or of an animal in which it is desired to hasten maturity. In Nov. 1927 Prof. Pardubsky together with an international commission was given an opportunity to study the effect of this Veronoff-operation upon a bull, called Jacky. This animal was twenty years of age. Four years previously when the animal was then six-

[5] Pardubsky, K. Prof. Dr., Sonder Ausgabe Wr. Tierärztliche Monschft. XvJg. H. 17, 1928. Festschrift für Prof. Dr. Th. Schmidt.—Abst. by H. J. Magens.

teen years of age and in a very severe state of senile depression, i. e. trembly, much emaciated, etc., and impotent for three years, it was operated upon. It was proved that the animal produced offspring following the operation until his nineteenth year, when it again became impotent and exhibited signs of advanced age. A second operation was performed and at the time of observation by the international committee (seven months after the second operation) the animal was in splendid condition, was very much on the alert and gave evidence of his power of coitus in front of the commission.

After the inspection the bull "Jacky" four herds of sheep were inspected; two herds consisted of operated animals, the other two were considered controls. The animals operated upon showed (1) a greater weight, on the average 10 kg. (22 pounds) (2) very much increased wool production, (3) production of finer and longer staple wool.

Of far greater importance, however, was the observation that the qualities biologically changed in the animals operated upon were heritable. Comparison of two herds, one the descendants of Veronoff-grafted rams and the other the offspring of non-operated animals showed conclusively increased average weight in the former of 7.2 Kg., and an average of 22 ounces greater wool production. Further the wool was of longer and finer staple. The results in the offspring were thus similar to the findings in the operated rams themselves.

By the Veronoff operation it thus seems that the process of improving breeds may be shortened very much.

In horses the operation did not seem very promising. Experimental work would be welcome everywhere.

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## Experiences with Nasal Passage of Stomach Tubes as Modified by Neumann-Schultz

This report made by Dr. Alfred Srnetz, Assistant in the Surgical clinic of the State Veterinary College at Brünn, is based upon experiences at that clinic with the stomach tube modified as recommended by Neumann-Schultz[6]. Although many times mentioned and much talked about this modification, although a very useful adjunct in veterinary practice, has not been used as extensively as it merits. Since the use of this modified tube will undoubtedly soon become common practice the author offers his experiences with it. Since spring 1928 the tube has been used constantly, on some days several times at this clinic. Besides the students are given, twice a week, the opportunity to pass tubes on experimental animals.

According to the author's experience the stomach tube, as recommended by Wirth which is the improved tube by Neumann-Schultz with stylus, has given the best results. The stylus was made at the clinic from reed. Introduction is simple and without any danger. Numerous contemporary authors are mentioned by the author in favor of this particular type of tube. All agree that the stomach tube without stylus often turns in the pharynx and *even in the esophagus*. Numerous passings of the tube without stylus by the author were made and in many cases the tube reappeared through the other nostril or even passed back into the oral cavity where it was promptly chewed up. Doubling back of the tube even after it was in the esophagus was proved by the fact that water would not flow through. Thinking that this was due perhaps to temporary paralysis of the esophagus they used a strong force pump as recommended by Schouppe at Graz (Austria). Still there were no better results. Since using the tube with the stylus

[6] Srnetz, Alfred Dr., Asst. Surgical Clinic State Vet. College at Brünn. Experiences with nasal passage of stomach tubes modified by Neumann-Schultz. *Prager Archiv für Tiermedizin und vergleichende Pathologie.* Part B. IX Volume June 15, 1929.—Abst. by H. J. Magens.

no further cases like these occurred. The author therefore ascribes the cause of these accidents to the flexibility and softness of the tube.

The tube recommended consists of two parts which are united by celluloid tubing. Anyone can make the stylus by using a soft reed of 5mm thickness, to which is fastened on one end a file handle. The tube is taken apart, the stylus passed through the longer part of the tube (2 meters) after being well oiled. One end of the stylus will be fixed by the file handle. The distal end of the tube should extend two centimeters beyond the stylus.

Method of application: Try at first passage through right nostril. The fingers of the left hand will press the oiled tube firmly upon the base of the nostril into the lower passage, while the right hand advances the tube slowly. Either ear or nose twitch is used only in unruly animals. During the introduction of the tube into the nose the horses are very often somewhat restless which will generally subside when they feel the tube enter the larynx and the esophagus. As soon as the tube enters the pharynx one will meet with a slight resistance. Through light pressure, sometimes by turning or by slight forward and backward motions of the tube one will easily cause deglutition and the tube may then be advanced further into the esophagus. According to the wave of deglutition one will feel slight pressure upon the tube.

According to the experiences of the author it is very difficult to enter the tube into the trachea. For the same reason, the danger of causing traumatic pneumonia is slight. Just one time they succeeded in inserting the tube, without stylus into the trachea without hearing the animal cough. After pure water had been poured into the tube the animal coughed at once and the water was immediately ejected through the nostrils. This occurrence was without harmful sequel of any sort. The cough, however, is not a reliable criterion as to whether or not the tube is in the trachea or the esophagus. Even the observation as to whether air issues from the tube upon expiration is not always reliable. A very reliable procedure is to place the free end of the tube under water in a bucket or a tub. Should the tube be in the trachea air will bubble up through the water simultaneously with expiration.

Technic of introduction of tube:

1. Press tube ventrally towards bottom of nares firmly when introducing it.
2. Resistance at pharynx. Slight pressure, forward and backward motion, turning of tube, observation of act of deglutition.
3. Palpation with both hands in median region of neck. If the animal is not alarmingly fat one will plainly feel the tube with the stylus in the esophagus on the left side of the neck.
4. In case of severe cough pull out tube at once and try introduction into other nostril.
5. Remove stylus and fasten second part of tube. By blowing strongly into the tube one will often succeed in bringing about swallowing which may be seen on the left side of the neck.
6. Place funnel into position. Pour slowly one-half to one liter of warm water into tube. If the tube is in the trachea the water will be coughed up at once.
7. Pouring in of medicated liquids.
8. Lower end of tube and allow the remainder of liquid to run off. Do not remove tube too quickly; hemorrhage may be caused by so doing.

In veterinary practice one can use the tube almost daily for all medication *per os*. The dosage will be far more accurate due to the fact that there is practically no waste.

The author mentions the advantages of chloral hydrate narcosis for horses by this method. He also describes cases which were artificially fed that way while they were convalescing; in one case from a mandibular fracture.

**Two Cases of Impeded Micturition**

In beginning, the author, Wilhelm Koppitz,[7] former Chief State Veterinarian, mentions that for the practicing veterinarian in the field diseases of the urinary tract and organs are rather difficult to diagnose. It is for this reason he has made available his experiences in the two cases following:

Case No. 1. When the author arrived at the place to examine the animal he was shown a strong well-fed cow of draft and general purpose type, Kuhländer breeding, which looked normal but for the fact that she took the characteristic position of a cow about to urinate at very short intervals and passed at each act only a very thin small stream of urine.

Anamnesis revealed that the cow had been bred to a bull eight days previously and had been in her present condition ever since. When lying down she could micturate freely apparently without exerting any special effort.

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Examination showed that the cow was unable to move her tail, the base of which was rather high up, covering the rectum and the vagina completely. Internal examination per rectum revealed at the point of junction of the first caudal and the last coccygeal vertebrum a hard bony ridge somewhat uneven in shape. In lifting and moving the parts horizontally and vertically a rather loose connection of the coccygo-caudal joint was noticed without there being any pain. This finding had to be diagnosed as a fracture.

The bladder was very much distended by urine, and could be emptied easily by manual pressure in direction from the body of the bladder towards its neck. The urine was normal. In this manner all diseases of the bladder or the urinary tract were excluded. *Retentio urinae* therefore was to be ascribed to a paralysis of the bladder due to influence of the fracture upon the spinal nerves in the coccygo-caudal region. The fact that the cow urinated when lying down may be explained by the pressure of the abdominal organs, which could not occur when she was standing up.

Considering the fact that the condition had become very much worse since its beginning at the time of injury and prognosis was not very encouraging, the owner was advised to kill the animal for food since she was in very good physical condition.

With regard to these fractures the author states that in most cases they have in their wake only a faulty position of the tail. Rarely ever are there any paralytic symptoms within the internal organs of the abdomen. They can be very much improved in many cases by placing a support under the tail similar to the crupper of horse harness.

Case No. 2. Anamnesis of the second case revealed that the subject, a very young animal in good condition could urinate only with very great difficulty and that the condition was growing worse. Finally she managed to pass but very little urine intermixed with a reddish dirty looking discharge mucous in character. The general condition of the animal and appetite were still satisfactory when the author was called in on the case.

The cow for a time and the findings described in the anamnesis were confirmed. The residue from the urine was stained with a 10 per cent solution of Fuchsin and under 200 magnification one could see red blood corpuscles in very large numbers, columnar epithelium and detritus. The characteristic tube shaped, cylinder type cells coming from the ureters were not observed. Further examination by manual exploration through the rectum revealed a normal position and condition of the kidneys, but the base of the bladder offered more resistance to touch, the walls being thickened and rough. All other parts of the bladder felt normal.

From these findings concludes the

[7] Wilhelm Koppitz. Two cases of impeded micturition. *Prager Archiv für Tiermedizin und vergl. Pathologie.* Part B. VIII Volume Nr. 11. Nov. 15, 1928. Abst. by H. J. Magens.

author a neoplasm in the bladder itself was responsible for the obstruction. In this case also butchering was recommended before uremic poisoning rendered the carcass unfit for consumption. Postmortem examination revealed a freely bleeding neoplasm in the base of the bladder, which influenced contraction of the organ in the worst manner. Since the lesion was local in character and the animal's condition perfect the carcass was passed as edible.

In these cases the cause, location and character of the *retentio urinae* were quite different, but could be revealed easily and positively diagnosed by simple clinical methods.

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### Brazilian Experiments with B. C. G.

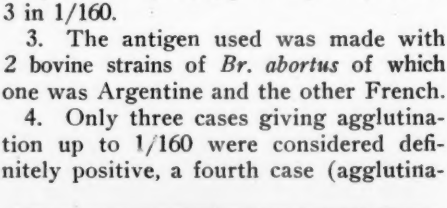
Summarizing the record of considerable experimental work with B. C. G. vaccination of calves Travassos[8] gives the following:

1. In our experiments the B. C. G. did not produce permanent lesions in guinea pigs.
2. The visceral lesions caused by the B. C. G. are entirely retrogressive, *restitutio ad integrum*, both functional and histological, being the outcome in all cases.
3. The attenuated strength of our B. C. G. strain seems to have been fixed by inheritance up to the present.
4. How long that strain will be stable we have no means of knowing, but it seems not impossible for its original virulence to be recovered.
5. Thus far we have seen no ill effects on new-born calves from the B. C. G. vaccination.
6. Our experience on children vaccinated with B. C. G. and left in contact with tuberculous parents (or relatives) lead us to believe in their increased resistance to infection by tubercule bacilli.
7. The chance of a favorable outcome will be increased if the children are kept away from any source of infection at least during the first month following vaccination.
8. Death-rate among children living in Porto Alegre, Rio Grande do Sul and vaccinated with B. C. G. was much lower than that found among unvaccinated children in the same city (7% as against 16 to 20%).
9. Our experience with B. C. G. immunization of bovines is too limited to warrant any conclusions, although we believe in the possibility of gradual eradication of the disease from herds solely by vaccination of the new-born with B. C. G. as claimed by Guerin, Richart and Boissier.

### Br. Abortus Agglutination of Blood Sera of Japanese Immigrants

A serological study was made on 221 samples of human serum. 164 sera were examined for Wasserman, Widal and Weil-Felix reactions. Neiva[9] summarizes the investigation as follows:

1. In 1928 some work on cows revealed the serum of 10.23% of them giving a positive agglutination with *Brucella abortus*.
2. In tests made on 221 samples of human serum, 5 cases were found to agglutinate *Br. abortus* in 1/10 dilution; 10 in 1/20; 2 in 1/40; 1, partially in 1/80 and 3 in 1/160.
3. The antigen used was made with 2 bovine strains of *Br. abortus* of which one was Argentine and the other French.
4. Only three cases giving agglutination up to 1/160 were considered definitely positive, a fourth case (agglutina-



[8] Travassos, J.; A Vaccina Tuberculosa de Calmette-Guerin; Revista da Sociedale Paulista de Medigcina Veterinaria, Sao Paulo, Brazil; March-April, 1930, Vol. 1, No. 3.

[9] Neiva, Cicero; Agglutininas para Brucella Abortus em Soros Humanos; Revista da Sociedade Paulista de Medicina Veterinaria, Sao Paulo, Brazil; March-April, 1930, Vol. 1, No. 3.

tion 1/80) being considered partially positive.

5. These four positive sera for *Br. abortus* were taken from newly arrived Japanese immigrants, whose blood cultures, however, gave negative results.

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**The Place of Iodin in Veterinary Practice**

A number of interesting sheep and pig feeding experiments are quoted by Reid[10] both from England and America, in which it is shown that the inclusion of small doses of potassium iodid in the diet encourages rapid growth and early maturity. There is also some evidence, although as yet not conclusive, that fertility is increased. In goitrous districts in which the pastures and drinking water are deficient in iodin very marked improvement in condition and fertility of stock attends the inclusion, in the diet of iodids.

Dealing with specific and general diseases, Col. Reid's book serves to remind us of the work which has been done and the good results obtained by the use of iodin in the treatment of such conditions as actinomycosis, equine influenza, strangles and pneumonia, purpura hemorrhagica, endometritis and sterility in cattle.

Quoting experiments carried at the Storr's Agricultural Experimental Station, Connecticut, good results are reported to have attended the use of iodin in the form of Lugol's solution in the treatment of parasitic gastritis in sheep.

As a prophylactic, Col. Reid produces a little evidence to show that the use of potassium iodid reduces the incidence of joint-ill in foals; and in dealing with contagious abortion tends to discredit the use of live vaccines of *Br. abortus,* and recommends that an extended trial be given to potassium iodid as a prophylactic, based, not upon any definite evidence, but upon reports which support the view that iodin influences favorably infective processes of the most virulent types.

Chapters are devoted to the use of iodin externally; internally; in the prevention and treatment of specific and general diseases and diseases of undetermined origin; as a parasiticide; and finally, the influence of iodin on nutrition, reproduction and disease resistance.

The book contains a lot which is controversial; if Col. Reid is right, iodin has an unlimited field of usefulness in therapeutics. It is recommended that it be widely read, and some of its suggestions at least given a trial.

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**Brucellosis (Undulant Fever) and Veterinarians**

Huddleson,[11] in a recent article, gives some conclusions as to the pathogenicity of *Brucella abortus* for man. It should be mentioned that Huddleson divides the Brucella species infecting goats, cattle and swine, into three species, terming them, respectively, *Br. melitensis, Br. abortus* and *Br. suis* (Traum). He is alone among the authorities in thus assigning a species name to the three organisms that others regard as varieties of the same species.

There is overwhelming evidence that *Brucella abortus* Bang is capable of producing a disease in certain individuals not unlike that produced by *Brucella melitensis* Bruce. If *Brucella abortus* is highly pathogenic for man, why should not the disease be found in a large number of veterinarians whose occupation necessitates frequent contact with infective material such as aborted fetuses and retained fetal membranes? This has been a moot question for some time and its answer, in the absence of any experimental evidence whatever, has been highly speculative. There is no group of individuals that comes into contact more often with as large a quantity of and as virulent *Brucella abortus* infective material as do practicing veterinarians; and if this species of *Brucella* is anywhere near as highly pathogenic for man as the other two species of this genus,

[10] Reid, H. A., [Lt.-Col., O.B.E., F.R.C.V.S., D.V.H., F.R.S.E.]. The Use of Iodin and its Compounds in Veterinary Practice.—88 pp. 1929. London: De Gruchy & Co., Ltd., 45 Mitchell Street. [3s. 6d.] From the *Tropical Veterinary Bulletin.*

[11] Huddleson, I. Forest, and Howard W. Johnson: Brucellosis—The Significance of Brucella Agglutinins in the Blood of Veterinarians; *Journal A. M. A.;* Vol. 94, No. 24, June 14, 1930.

namely, *Brucella suis* Traum and *Brucella melitensis,* we should expect to find as large a percentage of them infected or presenting a history of having had the disease.

During a recent conference of Michigan veterinarians at the Michigan State College, an opportunity was presented to acquire some light on the subject. The results proved to be interesting and enlightening.

Altogether, blood specimens of forty-nine practicing veterinarians were examined for agglutinins by means of the rapid method. Of these, fifteen agglutinated the antigen completely in a 1 : 50 dilution; six in a 1 : 100 dilution; three in a 1 : 200 dilution, and four in a 1 : 500 dilution; twenty-one specimens were negative. In other words, 57 per cent of those examined showed agglutinins in their blood and 26 per cent showed agglutinins in a titer (1 : 100 and above) that is generally accepted as indicating active infection.

In the light of the results obtained in this group of veterinarians, it is reasonable to assume that the *Br. abortus* possesses a low pathogenicity for human beings, or that most persons possess a native resistance to this strain of the organism, or both.

In other words, *Br. abortus* has invasive properties for humans as has been already made clear by its isolation in ill people in various parts of this country and northern Europe, but for the vast majority of people, it is not highly pathogenic. A definite minority group, however, when exposed to a sufficient amount of *Br. abortus* of infective nature, develop undulant fever.

Since there is yet no known means other than exposure to infection by which those susceptible to infection can be distinguished from those not susceptible, it is advisable that every one guard against undue exposure to material containing *Br. abortus* as well as that containing *Br. melitensis* and *Br. suis* which are known to possess greater pathogenicity for man.

For several years Huddleson has observed that many veterinarians suffer from a peculiar erythema of the skin of the forearms following contact with the vaginae of cows that have aborted. The number of cases of this condition have become so numerous that a thorough investigation was decided upon and of 50 practicing veterinarians questioned, 20 per cent stated that a cutaneous rash appeared on the arm after the removal of retained fetal membranes or after sterility work. They were of the opinion that the rash appeared only after they had treated animals infected with *Br. abortus.*

The erythema makes its appearance usually in about 20 minutes after contact with the mucous surface of the vagina of the cow. Two types of erythema have been observed. In one type, light red irregular blotches appear on the skin, or the entire surface of the forearm may become a light red. When viewed closely these blotches appear as minute reddish points slightly separated, while from a distance they have the appearance of an erythema. They are not elevated. There is an intense itching or burning sensation. The discoloration disappears in four to eight hours. There is no exudation or desquamation.

In the second type, the rash appears as discrete reddish elevated papules. The accompanying itching and burning is very severe. The papules persist for three or four days. Their color changes to dark brown. There is no exudation or desquamation.

An intradermal test was given the veterinarians who had experienced this rash and to an equal group who had not been so affected as controls. The conclusion was that the rash was due to contact with *Br. abortus* or products of its growth.

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### Undulant Fever in Man and Abortion Disease in Cattle

Much publicity has been given to the problem of undulant fever in man. Some of this publicity has been unwise and has left the lay reader with the impression that the disease in man comes wholly from the consumption of raw milk from abortion diseased herds.

In a recent publication, Hallman [12] states

[12] Hallman, E. T., and E. L. Anthony; Undulant Fever in Man and Abortion Disease in Cattle; Agricultural Experiment Station, Michigan State College, Circular Bulletin No. 128.

that: "It is impossible, with available knowledge, to point to the most common source of infection."

There are three types of organisms that may cause undulant fever in man, the goat type, the cow type and the pig type. No one can state definitely which type of germ is the most frequent cause of the disease in man in the United States. Of 28 strains of *Br. abortus* isolated from humans in Iowa, 21 were of the pig strain. Of 22 strains of *Br. abortus* isolated from human cases in Michigan only one was of the pig strain and 21 were of the cow strain. No one can definitely point to all the sources of infection, nor state which is the most important one.

The available information indicates that the consumption of raw milk is not as important a source of infection as others. A study of 500 inmates in a state institution was made. Raw milk was a part of the daily diet. The milk and cream were provided entirely by the dairy herd belonging to the institution. Practically all animals in the herd were infected with contagious abortion and the *Br. abortus* could be readily isolated from the milk. Only four inmates gave a positive reaction and only one of these had a clinical case of the disease.

There is no evidence that human males are more susceptible to the infection than females and yet among farm residents in Iowa there are nine times as many cases among men as among women. The evidence seems to indicate that contact with infected animals was the principal source of infection in these cases, since there is no reason to believe that women consume less milk than men.

Hardy found the incidence of undulant fever in towns of less than 5,000 population to be 8.3 persons per 100,000 population. Among the rural population, it was 11.4 persons per 100,000 population. Among packing house employes it was 287.5 persons per 100,000 population. The fact that undulant fever is 25 to 30 times as prevalent among packing house employes as it is among raw milk consumers leads to the belief that it is an occupational disease coming from direct contact with infected animals rather than through milk consumption; and even in the rural population, the largest consumers of raw milk, it appears to be an occupational disease since nine times as many men as women in rural sections have contracted the disease.

Hallman does not want these facts to be interpreted as an attempt to belittle the importance of a milk supply free from abortion disease organisms. No raw milk should be consumed if there is a possibility that it contains germs pathogenic for man. However, recent propaganda has over-estimated the dangers of acquiring the infection through the use of milk and has unduly excited the uninformed consumer of milk.

Aside from its possible relation to human health, there is an economic phase of the problem of contagious abortion in cattle which the producers of milk and breeder of cattle should consider very seriously. A study of the milk records of an infected herd over a period of four years at the Illinois Experiment Station, showed that the lowered production of the aborting cow amounts to a loss of $54.00 annually. A similar study showed an annual loss per aborting cow in the Nebraska Experiment Station herd of $107.00. Investigators at the Storr's Agricultural Experiment Station in Connecticut found the loss per reacting (not necessarily aborting) cow to be $44.00 yearly. If the lowest estimated economic loss is applied to the situation in Michigan, abortion is costing an annual loss to Michigan dairymen of $5,644,000.

Restrictions are now being placed on the interstate movement of cows reacting to the contagious abortion test. It is estimated that within five years every state in the Union will enforce such restrictions. This will destroy the market for surplus dairy cattle unless they can be shown to be free from contagious abortion. The author is convinced that the problem will be solved just as the problem of contagious pleuropneumonia was solved in the 80's, just as the problem of foot and mouth disease has been solved repeatedly, just as the tuberculosis problem is being solved, and as the

tick fever problem is approaching solution.

The desire to produce a healthful food product, the economy of its production, and the future prosperity of the dairy cattle industry in Michigan makes a careful, sane, and conscientious study of the abortion problem by the dairymen of the state of prime importance at this time. A prompt utilization of the means that have been demonstrated to be effective in economically and successfully dealing with it is equally important.

### Coccidiosis of Swine

The literature regarding coccidiosis of the pig is very scanty, but it would appear that the disease merits more attention than it has received.

Even in cases that run a rapid course and terminate fatally the lesions may be so inconspicuous as to escape detection with the naked eye, and examination of the intestinal contents may furnish no indication of the severity of the disease.

Carré[13] believes that coccidiosis is a prior condition to many of the conditions caused by organisms of suppuration.

### Feeding and Diseases of the Fox

To meet an ever increasing demand for authoritative information on feeding and diseases of the fox, Law[14] has prepared a 48-page bulletin, in which is described the practices that have been successful in the operation of the Provincial Experimental Fur Farm of Ontario.

A great difference of opinion exists among successful fox ranchers on the subject of feeds and feeding and a beginner is at a loss as to the methods to follow to contribute to his success.

In feeding foxes there are problems to be considered that are not encountered with other classes of live stock. On the color and density of the pelt depends to a great extent the market value of the silver fox, and color and density can be influenced by the quantity and quality of the feed. Climatic conditions are also a factor in feeding, as is also availability of feed. For example, fish is a valuable feed for foxes. In some places there is a plentiful supply at a low price, in others no supply is available.

With the exception of cereals, the feeds of foxes should be given raw. Cereals require a thorough cooking. Milk should be fed only when mixed with cereals. At no time should it be left in the pan for the foxes to drink at will. Ground bone to the extent of 5 per cent to 10 per cent of the total feed should be incorporated in the daily feed of foxes.

Raw flesh forms one of the important articles of diet of the fox and is essential for his proper development. The ration in June, July and August should not exceed three ounces of meat per day. One-third of this should be offal. In the fall, the meat ration may be increased up to five ounces and in December and January, six to seven ounces are required. Best results are obtained from feeding once daily in the summer and twice daily in the winter.

In the summer, it is advisable to limit the cereal ration to stale white read. In the fall and winter months, rolled oats, corn meal, whole wheat flour and bran may be added with advantage. Approximately two ounces of cereal per day seem to meet the requirements of the average animal. Fresh vegetables are required. They are the main source of vitamin C and add bulk to the ration. In the summer, spinach, carrots, young clover, beets, apples, etc., are fed with advantage. In the winter, carrots and beets are used.

Milk is a valuable food when mixed with the cereal. The quantity should not exceed three or four ounces per day. Eggs are valuable for pups and pregnant females. Because of its effect on the pelt cod liver oil is not advised except for puppies. Yeast can be fed with benefit during the winter months.

The feeding of the pregnant female and the feeding of puppies are the subjects of separate chapters and are dealt with in detail.

[13] Carré. La coccidiose du porc.—*Bull. Acad. Vét. France*. 1929. June. Vol. 2. No. 6. pp. 218-220. Reprinted from *Tropical Veterinary Bulletin*.

[14] Law, Ronald G.; Feeding and Diseases of the Fox; Ontario Government Experimental Fur Farm, Kirkfield, Ontario; Bulletin No. 2.

The diagnosis of diseases of foxes offers considerable difficulty even to the experienced. The appearance of the eye, the condition of the appetite and a microscopic examination of the feces are relied upon to a considerable extent in making diagnosis.

Among the internal parasites harmful to foxes, are: The round worm, *Belascaris marginata,* hook-worm, *Uncinaria stenocephala;* lung worms, *Capillaria aerophila;* bladder worm, *Capillaria plica,* and tapeworms.

Common external parasites of the fox include: Ear mites, *Otodectes cynotis;* fleas, *Ctenocephalus vulpes,* and mange mites, *Sarcoptes scabiei vulpes.*

Stomach and intestinal disorders in foxes can, as a rule, be traced to improper feed or parasite infestation.

Among the infectious diseases leading to the greatest loss of foxes are: Paratyphoid, food poisoning, encephalitis and tuberculosis. The latter is not common in this animal.

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### An Intradermal Test for Pullorum Disease

The universally recognized reliability of the tuberculin test, and high degree of accuracy that is being attained with the agglutination test for infectious abortion, together with the great utility of these tests in the detection of animals affected with these diseases, and the eradication of these diseases from herds, has offered an inducement to those interested in the control of pullorum disease of poultry, to adopt the agglutination or the pullorin test for the recognition of this disease that many have been unable to resist. As a result, poultry literature is flooded with advertisements of eggs and chicks from "bacillary white diarrhea free" flocks and "accredited pullorum disease free" and "state accredited," etc. These various "frees" are based upon the results of a test that in three critical experiments (Wisconsin, Minnesota and California), has shown itself to be only about 50% accurate.

Because of the reputation that has been built by accredited herds and tuberculosis free herds and abortion free herds, etc., advertising a flock of chickens as free from pullorum disease on the basis of its members having passed a negative agglutination test is doubtless effective sales promotion—for the present. But, what of the near future? Have poultry breeders and poultry sanitarians no vision?

Previous work at the Wisconsin and other experiment stations, having "shown the agglutination test (for pullorum disease) to be very erratic," Beach[15] and associates carried out some experiments with specially grown and concentrated pullorins used intradermally—in the skin of the wattle.

Of the 57 hens used in the first experiment, 30 (52.6%) were infected as shown by bacteriological examination at the time of slaughter. Of the infected hens 9 (30%) reacted to the pullorum filtrate; 8 (26.6%) reacted to the cellular pullorin; 18 (60%) reacted to the agglutination test. Of the 27 non-infected hens there were no reactions with the pullorin filtrate, 6 (22.2%) reacted to the cellular pullorin and 3 (11.1%) to the agglutination test.

Of 50 hens used in the second experiment, with a concentrated pullorin, 33 (66%), were infected as shown by bacteriological examination of the ovaries at the time of slaughter. Of the 33 infected hens, 23 (69.6%), reacted to both tests. Twenty-nine (87.2%), reacted to the pullorin test. Twenty-five (75.7%), reacted to the agglutination text. Of the 17 hens in which pullorum infection was not found in the ovaries, 9 (52.9%), reacted to the pullorin test, and 12 (70.5%), reacted to the agglutination test.

Forty hens were selected to test pullorin No. 2. Twenty-three (57.5%) were infected, as shown by bacteriological examination. Of these 23 infected hens, 16 (69.5%) reacted to both tests; 21

[15] Beach, B. A., Clayton Holmes and C. R. Strange; An Intradermic Test for the Detection of Salmonella Pullora Infection; Wisconsin Aric. Exp. Sta.; Reprint from *Journal of A. V. M. A.* Vol. XXIX, No. 4, April 1930.

(91.3%) reacted to the test with pullorin 2; 18 (78.2%) to the agglutination test. The remaining 17 hens failed to reveal ovarian infection. Of these, 11 (64.7%) reacted to pullorin, 6 (35.2%) reacted to the agglutination test, and 5 (29.4%) reacted to both tests.

The poultry industry stands in need of a diagnostic agent that will detect a high percentage of the infected birds and at the same time cause few of the non-infected to react. The work herein reported is a statement of progress only. The claim is not made that either of these pullorins has given entirely satisfactory results.

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### Cows Infected with Streptococcus Epidemicus (Davis)

Sixty-three cases of septic sore throat were assigned by the health department of Madison, Wis., to the drinking of raw milk from a small dairy.

Hadley[16] investigated the dairy and found three cows suffering from mastitis. Two of the animals were giving milk that was definitely abnormal in appearance. The milk of the third animal was practically normal, except that on careful examination, small floccules were noticed. Bacteriological examination of the three samples revealed enormous numbers of hemolytic streptococcus—*Streptococcus epidemicus* (Davis) in the milk that contained the small floccules.

No organisms of this species, the one causing hemolytic sore throat in man was discovered in the other two samples or at the time in the milk of other animals in the dairy, although one of the latter later discharged such organisms in the milk, and the conclusion was reached that this animal was responsible for the 63 cases of septic sore throat that occurred among the consumers of milk of this dairy.

An examination of the udder of the cow, the milk of which contained the hemolytic streptococci, showed an enlargement of the size of a walnut at the base of the teat on the right front quarter. The left rear quarter was swollen and somewhat tender.

In four years that Hadley has been making routine examinations for hemolytic streptococci in the certified herds in the Chicago milk district, he has found eight cows infected with *Streptococcus epidemicus* (Davis). In other herds not certified dairies, he has found the *Strept. epidemicus* in the milk of nine cows, making a total of seventeen "epidemicus cows."

All of the epidemicus cows from the certified milk herds, with one exception, have been normal in appearance and any abnormality which may have existed in the milk was so slight as not to have been recognized on the stripping cup, although most of them developed clinical mastitis with changes in the milk later.

The one exception had a mild chronic mastitis.

In the nine cows in the uncertified herds, four were giving normal milk, and five were suffering from various degrees of severe and acute and persistent mastitis.

Of the 17 cows, two were associated with an epidemic of septic sore throat. So far as is known, no cases of septic sore throat occurred among the drinkers of milk of the remaining 15 cows.

Eight cases occurred among approximately 1,200 cows in the certified dairies during a course of four years.

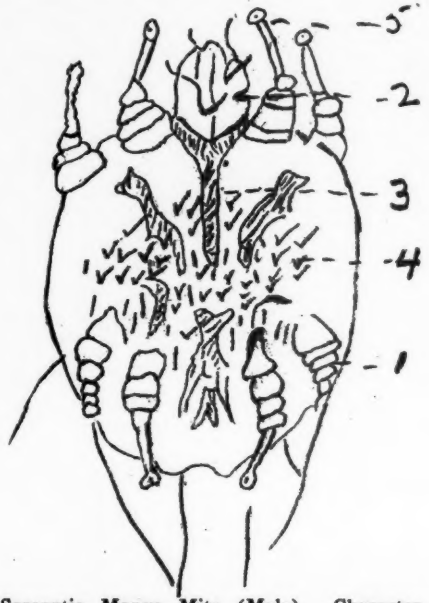
In summarizing his studies, the author says: "Our work would indicate that cows infected with streptococcus epidemicus are rather generally and widely distributed, and that this streptococcus undoubtedly occurs quite generally and frequently in milk used for direct consumption, as well as that which is used for cheese and butter making without producing disease. The infection of cattle with this human type of streptococcus apparently begins as a mild disease, which may became very severe or apparently continue a mild course. There is a tendency for the infected portions of the udder to lose their milk secreting function. In the group of mild cases to which most of our cows belong, there is little or no change from the normal in either the udder or the milk, although streptococcus epidemicus may be shed in large numbers."

[16] Frost, W. D., R. C. Tohmas, Midred Gumm and F. B. Hadley; Cows Infected with Streptococcus Epidemicus (Davis); Reprint from the *Journal of Infectious Diseases*, Vol. 46, No. 3, March, 1930.

## THE RELATIONSHIP OF UNDULANT FEVER OF MAN TO EPIZOOTIC ABORTION OF ANIMALS

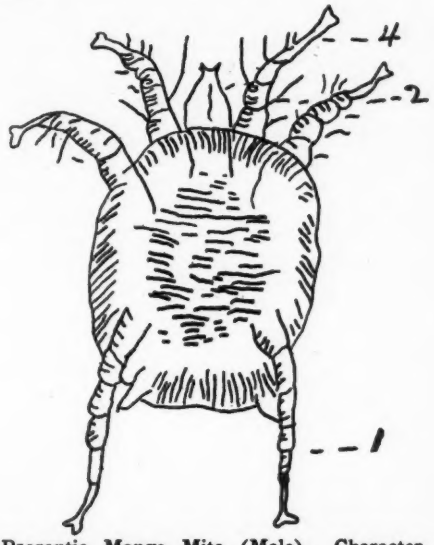
The following is a summary of this important subject from the Journal of the Royal Naval Medical Service, by the authors, Bassett-Smith:

*"Brucella melitensis* is very toxic and infective from goat to goat, goat to man, and




**Sarcoptic Mange Mite (Male). Characteristics: 1, Hind legs do not project beyond the body outline; 2, Head short and maxillae very strong; 3, "Y" marking below the head; 4, "Spines" (v) and "pins" on the back; 5, Suckers mounted on long unjointed pedicle.**

man to man, and is now very widely distributed. From goats, other animals may easily become infected and through them cause the disease in man (orchitis in about 4%, ovaritis and mastitis occasionally, rarely abortion). Infection was first reported in the Mediterranean area; it has passed to Asia, Africa and America. The infecting organism is specific, easy to cultivate and dangerous in the laboratory. *Br. abortus* is less toxic, infective mostly to bovine and porcine animals, almost always causes abortion, is specific, difficult to isolate, more irregular in morphology and growth, shows some serological differences, and rarely spreads by laboratory infection. By massive doses, it may cause in man a long irregular fever. Differentiation of the organism isolated in such cases is difficult to determine, whether due to a secondary melitensis or a primary abortus in the cow. Conveyance of undulant fever, as known in Europe, is generally due to infection from goats or sheep, but a bovine infection is possible. There appears to be little in favor of the theory that *Br. abortus* and *Br. melitensis* are the same organism with virulence altered by passage through different animals."




**Psoroptic Mange Mite (Male). Characteristics: 1, Hind legs project beyond the body outline; 2, Head longer than broad; 3, Absence of "Y" marking; 4, Small sucker mounted on long jointed pedicle; 5, General outline of body markedly longer than it is broad.**

There are many serious swine diseases, but cholera is by far the most important and since this disease can absolutely be prevented by vaccination it seems inconceivable that persons owning swine would risk the loss of that investment through failure to vaccinate, yet unfortunately many have taken that risk and as a result the swine industry is seriously threatened.—E. A. Cahill.

## PARTURIENT PARESIS WITH COMPLICATIONS

On the morning of June 17, I was called to see a cow about to die, according to her owner. What appeared to be a rather atypical case of milk fever was found, with a temperature 1° below normal.

The cow was down, but did not have a pronounced kink in the neck or twist to the side. She had freshened two days previously, but had failed to clean entirely. I diagnosed, as the initial stage of milk fever, and proceeded to inject into the blood stream, 250cc of calcium gluconate and advised the owner to report if the animal did not improve in an hour or two. I received no further information until about 6 o'clock in the evening, when I was advised that the animal had stood up during the day, changed her position somewhat, but had again resumed her former recumbant position. However, she took notice of things going on around her, drank water, and appeared normal in all respects, except that she failed to get up.

At 11 o'clock I was called again and found her with practically normal pulse and temperature 100.5°. Shortly after my arrival, she stood up, and walked to her calf, although staggering somewhat, I advised another injection of calcium gluconate and attempted to give this while she was standing. Before I succeeded in this, she went down precipitately, and stretched out on her side. Taking advantage of this opportunity and holding her head, I proceeded to give the injection.

After placing the needle I noticed a tightening of the muscles in the neck region, with pronounced enlargement of the vena cava. I thoughtlessly attributed this to a feeble attempt of the cow to rise. Before I had succeeded in giving more than 20cc of the solution, the cow died without a struggle.

On autopsy the next day, I found over the anterior surface of the right ventricle, considerable extravasation. The interior of the heart appeared normal except for slight petechia in the right auricle. The lungs did not collapse entirely, and the bronchi and bronchioles seemed filled with a frothy white exudate. In some places this was mixed with reddish serum.

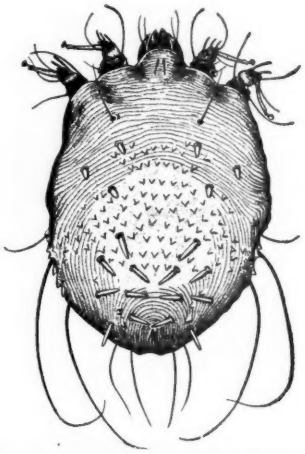
The omasum was greatly distended and the ingesta was pressed into very firm cakes between the leaves. There was a large section of the small intestine in which the entire wall was engorged with blood, but did not show any considerable thickening.

It was noted that in the uterus there was a collection of yellowish red fluid. There was still a section of the placenta adhering to the cotyledons. The wall of the uterus however, did not show any abnormal condition.

Everything else was normal, except a few petechia on the surface of one kidney. After the autopsy, it came out in conversation, that the animal had been quite constipated, according to the hired man.

My diagnosis was milk fever, plus a toxemia, due to metritis. I would be very glad to have the opinions of others on this case.

Amsterdam, N. Y. Hugh R. Mouat.



**Sarcoptic Mange Mite (Female). Magnified 100 Times.**